REPORT RESUMES

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EXPERIMENTAL SCORING MANUALS FOR MINNESOTA TESTS OF CREATIVE THINKING AND WRITING.

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DESCRIPTORS- *EXCEPTIONAL CHILD RESEARCH, *GIFTED, *TESTS, CREATIVE THINKING, TEST INTERPRETATION, CHILDREN, CREATIVE WRITING, CREATIVITY RESEARCH, ELEMENTARY GRADES, GROUP TESTS, SCORING, TEST RELIABILITY, TEST VALIDITY, MINNESOTA TESTS OF CREATIVE THINKING AND WRITING,

THIS MANUAL DESCRIBES PROPOSED SCORING PROCEDURES FOR THE MINNESOTA TEST OF CREATIVE THINKING AND WRITING. TEST FORMS FOR SIX VERBAL TASKS AND THREE NONVERBAL TASKS ARE PRESENTED. FOR MOST TASKS, THIS SCORING MANUAL HAS EXTRACTED FROM THE TEST PROTOCOLS FOUR SCORES TO REPRESENT FOUR ABILITIES OF CREATIVE THINKING-- FLUENCY, FLEXIBILITY, ORIGINALITY, AND ELABORATION. THE DETAILED SCORING INSTRUCTIONS INCLUDE EXPLANATIONS OF SCORING PROCEDURES A AND SCORED SAMPLE RESPONSES. DATA ON INTERSCORER RELIABILITIES, TEST-RETEST RELIABILITY, INTERCORRELATIONS AMONG SCORES, VALIDITY, NORMS, AND CORRELATIONS WITH SCORES FROM EARLIER MEASURES, ARE BASED ON SUBJECTS IN GRADE 5, GRADE 10, AND COLLEGE, AND ARE PRESENTED IN 20 TABLES. A FIRST REVISED EDITION OF A SCORING MANUAL FOR IMAGINATIVE STORIES, GRADES 3 THROUGH 6, IS PRESENTED. FOR EACH OF TWO FORMS, SUBJECTS WRITE A STORY ON ONE TOPIC CHOSEN FROM THE LIST OF 10 TOPICS. THE SCORING SCHEME EMPLOYS FIVE SUBDIVISIONS UNDER THESE SIX CATEGORIES--ORGANIZATION, SENSITIVITY, ORIGINALITY, IMAGINATION, PSYCHOLOGICAL INSIGHT, AND RICHNESS. A SUPPLEMENTARY SCORING GUIDE EVALUATES ORIGINALITY (NINE SUBDIVISIONS) AND INTEREST (NINE SUBDIVISIONS). FOR BOTH SCORING SCHEMES ON IMAGINATIVE STORIES, SCORING PROCEDURES ARE DESCRIBED AND EXAMPLES OF SCORED RESPONSES ARE INCLUDED. PRELIMINARY NORMS AND SOME DATA ON RELIABILITY OF SCORING ARE PRESENTED. A REFERENCE LIST OF 17 ITEMS IS INCLUDED. (JA)

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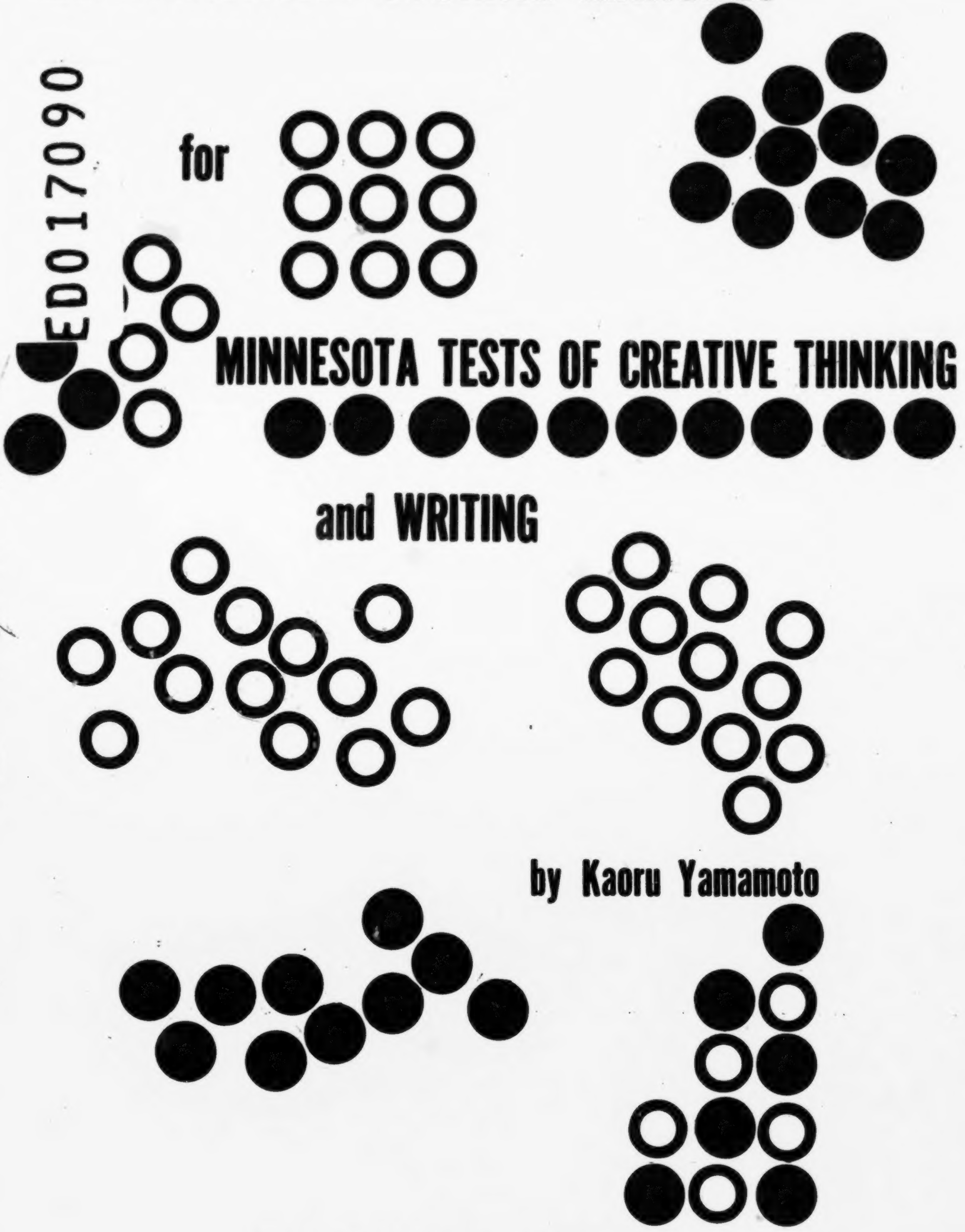

EXPERIMENTAL SCORING MANUALS

for

MINNESOTA TESTS OF CREATIVE THINKING

and WRITING

by Kaoru Yamamoto

Bureau of Educational Research
Kent State University

EXPERIMENTAL SCORING MANUALS

for

MINNESOTA TESTS OF CREATIVE THINKING AND WRITING

Suggested by
Kaoru Yamamoto

Bureau of Educational Research
Kent State University
Kent, Ohio

May 1964

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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No. I

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Table of Contents

Page
INTRODUCTION by O. L. Davis, Jr. 5
ACKNOWLEDGEMENT 6
REVISED SCORING MANUAL FOR TESTS OF CREATIVE THINKING (VERBAL AND NONVERBAL) 7
  Foreword by E. Paul Torrance 8
  Introduction 9
  Test Forms VA (Verbal Tasks) and NVA (Nonverbal Tasks) 11
  Scoring Schemes for Verbal Tasks 23
    Task I. Ask-and-Guess Test: Ask 24
    II. Ask-and-Guess Test: Guess Causes 27
    III. Ask-and-Guess Test: Guess Consequences 28
    IV. Product Improvement (Toy Dog) 33
    V. Unusual Uses (Toy Dog) 40
    VI. Consequences 44
  Scoring Schemes for Nonverbal Tasks 47
    Task I. Picture Construction 48
    II. Figure Completion 54
    III. Circles 62
  Quick-Reference Summary of Scoring Procedures 69
  Technical Appendices 75
    Relationships of Proposed Scoring Scheme with Original Scheme 76
    Interscorer Reliabilities of Proposed Scoring Scheme 83
    Test-retest Reliabilities of Proposed Scoring Scheme 86
    Intercorrelation among Scores on Proposed Scheme 90
    Validation Data on Proposed Scheme 93
    Some Norm Information on Proposed Scheme 95
    Studies in Which Proposed Scheme Was Employed 98
SCORING MANUAL FOR EVALUATING IMAGINATIVE STORIES 101
  Foreword by E. Paul Torrance 102
  Introduction 103
  Test Forms A and B 103
  Scoring Procedures 104
    Organization 104
    Sensitivity 107
    Originality 110
    Imagination 125
    Psychological Insight 128
    Richness 131
    Total Score 134
  Scoring Worksheet 135
  Reliability of Scoring 136
  Preliminary Norms for Grades Three through Six 136
  Appendix. Scoring of Sample Stories 139
  Supplementary Scoring Guide for the Evaluation of Originality and Interest by E. Paul Torrance 145
    Evaluating Originality 146
    Evaluating Interest 152
    Reliability of Scoring 154
    Preliminary Norms for Grades Three through Six 155
REFERENCES 157

Introduction

We are proud to present Professor Kaoru Yamamoto's Manual as the inaugural number of a Research Monograph series issued by the Bureau of Educational Research of Kent State University. Research workers in education and psychology are thus afforded his rationale and scoring procedures for their work in the study of creative thinking. It is hoped that the wide availability of this Manual will be useful in advancing research in this important domain of intellectual functioning.

A carefully developed rationale and a system for assessing responses on creative thinking tests is crucial to research in this field. In truth, if every researcher finds it necessary to develop his own rationale and scoring scheme, research efforts are inhibited. First, they are wasteful in terms of time, energy, and resources. In the second place, results are difficult to interpret and not easily related to previous research, thus making tenuous further hypothesizing.

Dr. Yamamoto's Manual should assist researchers to avoid these hazards in their work on creative thinking. He wisely cautions users *not* to assume that his Manual is the only rationale and scoring system for creative thinking tasks. As additional researches employing this Manual are reported, modifications will undoubtedly be suggested and implemented. The Manual invites more researchers to investigate the creative thinking of human beings.

Beginning his own research in this field while at the University of Minnesota, Dr. Yamamoto has continued this work since coming to Kent State University. He has published a number of scientific and theoretical papers which illuminate several dimensions of creative thinking. At present, his major research effort is focused on the social behavior of highly creative children under a U. S. Office of Education Cooperative Research contract.

Subsequent monographs in this series will publish the results of research studies in education conducted under the auspices of the Bureau. Currently underway are several major investigations including ones focusing on creative thinking, effectiveness of illustrations in text materials, language development of children, test taking behaviors of school pupils, characteristics of teacher candidates, problem solving strategies of school children, earth science curriculum development practices, and the curriculum of early Ohio schools. While numbers in this series will be issued irregularly, when taken together, hopefully they will evidence a wide range of scholarly interests in education manifest by the research programs in the Bureau.

O. L. Davis, Jr.
Acting Director

March 1964

Acknowledgment

This is a slightly revised version of the author's REVISED SCORING MANUAL FOR TESTS OF CREATIVE THINKING(FORMS VA AND NVA), together with his SCORING MANUAL FOR EVALUATING IMAGINATIVE STORIES. Both of these manuals were originally mimeographed at the Bureau of Educational Research, University of Minnesota for research purposes, the former in 1962 and the latter in 1961. They are reproduced here at the Bureau of Educational Research, Kent State University under the permission granted by its counterpart at Minnesota (Director, Dr. E. Paul Torrance; Office Supervisor, Miss Dorolese Wardwell).

The nature of these manuals, however, is not affected by the changes in the physical format of publication. They remain to be working manuals for our studies and the sole purpose of this publication is to make them more readily available for public examination and use so that an improved and refined scoring scheme may be developed out of the crude ones presented. For this reason, the author will appreciate receiving any feed-back the future users of this publication care to make concerning their studies on creative behavior. Only through cooperative accumulation of knowledge, can we hope to achieve the aspired progress in this important area of human exploration.

In this connection, it should be clearly recognized that the tasks discussed in this publication are not the only ones developed and experimented with at the Bureau of Educational Research, University of Minnesota and, that the scoring schemes described here are, likewise, not the only ones ever proposed. For the discussion of other kinds of tasks and scoring schemes, readers are referred to such recent publications as:

Torrance, E. P. *Guiding creative talent.* Englewood Cliffs, New Jersey: Prentice-Hall, 1962.

Torrance, E. P. *Administration and scoring manual for abbreviated Form VII Minnesota Tests of Creative Thinking.* Minneapolis: Bureau of Educational Research, University of Minnesota, 1962. (mimeographed)

Torrance, E. P., & Templeton, D. E. *Manual for verbal Form A Minnesota Tests of Creative Thinking.* Minneapolis: Bureau of Educational Research, University of Minnesota, 1963. (mimeographed)

Torrance, E. P. *Manual for Non-Verbal Form A Minnesota Tests of Creative Thinking.* Minneapolis: Bureau of Educational Research, University of Minnesota, 1962. (mimeographed)

Acknowledgment is here due all the colleagues of the author's, past, present, and future, for their stimulation and support.

K. Y.

February 1964

REVISED SCORING MANUAL FOR TESTS OF CREATIVE THINKING

(VERBAL AND NONVERBAL)

FOREWORD

From the outset of our work on developing measures of the creative thinking abilities, one of the most obvious defects has been the complexity of scoring. We were using these measures only for research purposes, however, and were anxious that we not obscure the effects of our experimental procedures by oversimplified scoring. Now that there is a demand for such measures in operational situations, there is an obvious need for a simplification of the scoring procedures. Yamamoto's proposed scoring procedures presented in this manual represent a first attempt to achieve this goal. Yamamoto and other members of the staff of the Bureau of Educational Research will continue to try to develop even more powerful and, if possible, simpler scoring procedures. We hope that others who have been given permission to use these measures will also engage in this kind of activity.

The preliminary data presented by Yamamoto is quite promising in many respects. A unifying rationale runs throughout the scoring of all tasks, verbal and non-verbal. Once this rationale is grasped, scorers are likely to achieve greater speed and reliability. It is promising that such high interscorer reliabilities were achieved after only a reading of the manual. It is also promising that the test-retest reliabilities for a three-month period are high (.87 for the total score and ranging from .57 to .85 for separate subscores for individual tasks). We are somewhat unhappy that the intercorrelations of the subscores are as high as they are. Previous evidence indicates that creative thinking is not a unitary ability and we have felt quite strongly that we must *avoid expressing the* "sum total" of one's creative thinking abilities by any one figure. Also, we do not know whether or not the present scoring procedures will yield as good results in the validity studies as we have obtained with the earlier procedures. The data are available and such checks will in time be run.

We are indebted to present and past members of the staff of the Bureau of Educational Research for the contributions which they have made in enabling us to reach the present stage. In the preparation of this edition of the manual, we are especially indebted to Mr. David George and Mr. Mark Siegmund for their work in accomplishing the scoring and other essential tasks.

To all who use this version of the manual, we invite your suggestions for improved scoring procedures -- major or minor. We also urge you to make available to us any normative data which result from your use of this manual.

January 1962

E. Paul Torrance, Director
Bureau of Educational Research
University of Minnesota

INTRODUCTION

In the past three years, various measures of creative thinking have been developed and tried out in the Minnesota Studies of Creative Thinking. These include both verbal tasks with verbal and non-verbal test stimuli and non-verbal tasks with non-verbal stimuli. Several test forms have been constructed by choosing different tasks from this assortment, including the two forms, called Form VA and NVA, to be discussed here. The former consists wholly of verbal tasks and the latter, of non-verbal tasks. Both forms have been used rather extensively among subjects of all ages, and, in addition, the Form NVA could also be administered to subjects of almost any group regardless of their particular languages.

Scoring schemes for these tasks were first devised by Torrance and Michie (1959), Torrance and Radig (1959), Torrance, Palm, Palamutlu, and Radig (1959), and Yamamoto (1960a), but successive revisions thereafter on personal bases have resulted in confusion. When stock was taken of all these experimental schemes in 1960 (Torrance, Yamamoto, Schenitzki, et. al., 1960), it was apparent that the preceding efforts had not necessarily brought us practical and theoretical improvement because of the lack of a systematic approach and of the loss of simplicity in these propositions. This revision, therefore, is an effort to regain simplicity and systematic formulation in our approach to reliable and meaningful scoring schemes for creative thinking tasks.

After Wilson (1958) and Guilford (1959), we would assume that creative thinking ability is not an entity in itself but rather made up of complex patterns of abilities such as sensitivity to problems, fluency of ideas, flexibility of ideas, originality, elaboration, and redefinition. These so-called primary abilities in creativity certainly make sense in our common experiences. Thus, one must be sensitive to the internal and external environment to recognize problems and start thinking; he must also be rich in ideas (fluency) to hit upon, pick out, and communicate good ones; he must further be flexible in his ideas to cover vast regions of possibilities without being caught in a rut; he must, in addition, be clever and original in his ideas to make a breakthrough; and quite possibly, he must be able to redefine, reorganize, and elaborate his ideas to come up with a final solution to the perceived problem.

In this manual, the writer tried, for most tasks, to extract four different scores from test protocols which, at their face, would represent four abilities involved in creative thinking; namely, fluency, flexibility, originality, and elaboration. *Fluency,* among these, is the simplest and the most clear-cut and it is represented by the mere number of distinct, non-repetitious ideas given by a subject in his response to the respective tasks. Single-track thinking could surely be highly fluent but it is not necessarily flexible and this fact, then, requires us to consider responses also for their *flexibility.* If a subject's flow of thought is not contained within a single category but can shift freely over time, this would certainly attest to his thinking flexibility. Flexibility in this revised scheme is, therefore, obtained by paying attention to the number of *runs* of ideas belonging to a few but inclusive categories, operations, or principles. By introducing this concept of runs into our scheme, and also by discarding the detailed enumeration of specific, minute ideas, we would be able to represent flexibility of ideas more faithfully in its dynamic form. It should also be pointed out that a repeated application of the same principles or operations could be highly "productive" but the resultant ideas might not be original at all. Our *originality* score, therefore, does take the basic principles or operations into consideration and gives differential weights to them according to the frequencies of their occurence among an appropriate population. Finally, *elaboration* of ideas is evaluated under the assumption that one must develop and work through his ideas to arrive at better responses and to communicate the results successfully. One can be a genius in his own right without affecting society at all because of his poor working-through and/or communication. In this fashion, we ended up with four scores, fluency, flexibility, originality, and elaboration for most tasks.

Naturally, no scoring scheme is final and one can change his system incessantly, hoping always to improve it. It is necessary to continue such efforts to attain more and more satisfactory results but, at the same time, it is also necessary for us to stop for a while, look back, and get organized before advancing further. For the latter purpose, this scoring manual presents an admittedly incomplete but at least simple and systematic scheme to be put to an experiment.

TEST FORMS

VA (Verbal Tasks) and NVA (Nonverbal Tasks)

(For Research Purposes Only)

Date: ____________________

MINNESOTA TESTS OF CREATIVE THINKING
(FORM VA)

Name: ______________________ Boy Girl Age: _______ Grade: _____

School: ______________________ Teacher: ______________________

How many brothers and sisters do you have? _____ brothers and _____ sisters

What kind of work does your father do? ______________________

What kind of work does your mother do? ______________________

What kind of work are you interested in doing when you grow up? ________

____

****

INSTRUCTIONS: In this booklet, you find several interesting things for you to do. All of these will give you a chance to use your imagination and to think of new ideas. There are no "right" or "wrong" answers in the usual sense. We want you to think of as *many ideas* as you can and also as *unusual, interesting,* and *clever ideas* as you can -- ideas no one else in your class will think of.

You will be given a time limit on each of these tasks, so don't waste time. Work fast. If you run out of ideas before time is called, wait until you are told to do so before you turn to the next page.

Do not pay any attention to the rest of this page. Turn to the next page when I give you the signal.

****

Part I	Fl	Ad	Fx	O	E	S-T
Part II	_____	_____	_____	_____	_____	_____

****

BUREAU OF EDUCATIONAL RESEARCH
University of Minnesota
1960

Part I: Ask-and-Guess Test

TASK I. ASK. The first three tasks will be based on a picture which will be projected on the screen (or displayed at the front of the room). The first task will give you a chance to show how good you are at asking questions. In the spaces below write down all of the questions you can think of about the things you see in the picture. Ask those questions you would need to know to understand what is happening. Do not ask questions which can be answered just by looking at the picture. (5 minutes)

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________
11. ______________________________
12. ______________________________
13. ______________________________
14. ______________________________
15. ______________________________
16. ______________________________
17. ______________________________
18. ______________________________
19. ______________________________
20. ______________________________
21. ______________________________

TASK 2. GUESS CAUSES. In the spaces below, list as many possible things as you can which might have caused the action shown in the picture. You may use things that might have happened just before the event in the picture, or something that happened a long time ago that had an influence on the present event. Make as many guesses as you can. Don't be afraid to guess. (5 minutes)

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________
9. ____________________
10. ____________________
11. ____________________
12. ____________________
13. ____________________
14. ____________________
15. ____________________
16. ____________________
17. ____________________
18. ____________________
19. ____________________
20. ____________________
21. ____________________
22. ____________________

TASK 3. GUESS CONSEQUENCES. In the spaces below, list as many possibilities as you can of what might happen as a result of what is happening in the picture. You may use things that might happen right afterwards or things that might happen as a result long afterwards in the future. Make as many guesses as you can. Don't be afraid to guess. (5 minutes)

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________
11. ______________________________
12. ______________________________
13. ______________________________
14. ______________________________
15. ______________________________
16. ______________________________
17. ______________________________
18. ______________________________
19. ______________________________
20. ______________________________
21. ______________________________
22. ______________________________
23. ______________________________

Part II: Test of Imagination

TASK 4. PRODUCT IMPROVEMENT. List below the cleverest, most interesting, and most unusual ways you can think of for changing the toy dog you will be shown so that children would have more fun playing with it. (8 minutes)

1. ____________________
2. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________
9. ____________________
10. ____________________
11. ____________________
12. ____________________
13. ____________________
14. ____________________
15. ____________________
16. ____________________
17. ____________________
18. ____________________
19. ____________________
20. ____________________
21. ____________________
22. ____________________
23. ____________________

TASK 5. UNUSUAL USES. List below the cleverest, most interesting, and most unusual uses you can think of for this toy dog other than as a plaything. (5 minutes)

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________
11. ______________________________
12. ______________________________
13. ______________________________
14. ______________________________
15. ______________________________
16. ______________________________
17. ______________________________
18. ______________________________
19. ______________________________
20. ______________________________
21. ______________________________
22. ______________________________
23. ______________________________
24. ______________________________

TASK 6. CONSEQUENCES. In the spaces below list all of the possible consequences you can think of for each of the improbable events or conditions listed below. (5 minutes)

A. What would happen if men could become invisible at will?

1. ____________________

2. ____________________

3. ____________________

4. ____________________

5. ____________________

6. ____________________

7. ____________________

B. What would happen if a hole could be bored through the earth?

1. ____________________

2. ____________________

3. ____________________

4. ____________________

5. ____________________

6. ____________________

7. ____________________

C. What would happen if the language of birds and animals could be understood by men?

1. ____________________

2. ____________________

3. ____________________

4. ____________________

5. ____________________

6. ____________________

7. ____________________

(For Research Purposes Only)

Date: ________________

MINNESOTA TESTS OF CREATIVE THINKING
(FORM NVA)

Name: ______________________ Boy Girl Age: ______ Grade: _____

School: ________________________ Teacher: ____________________

How many brothers and sisters do you have? _____ brothers and _____ sisters

What kind of work does your father do? ____________________________

What kind of work does your mother do? ____________________________

What kind of work are you interested in doing when you grow up? _________

____

******

INSTRUCTIONS: In this booklet, you find several interesting things for you to do. All of these will give you a chance to use your imagination and to think of new ideas. There are no "right" or "wrong" answers in the usual sense. We want you to think of as *many ideas* as you can and also as *unusual, interesting,* and *clever ideas* as you can -- ideas no one else in your class will think of.

You will be given a time limit on each of these tasks, so don't waste time. Work fast. If you run out of ideas before time is called, wait until you are told to do so before you turn to the next page.

Do not pay any attention to the rest of this page. Turn to the next page when I give you the signal.

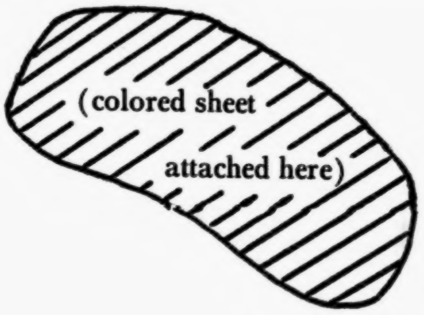
******

	Fl	Ad	Fx	O	E	S-T
Part I						
Part II	______	______	______	______	______	______

****

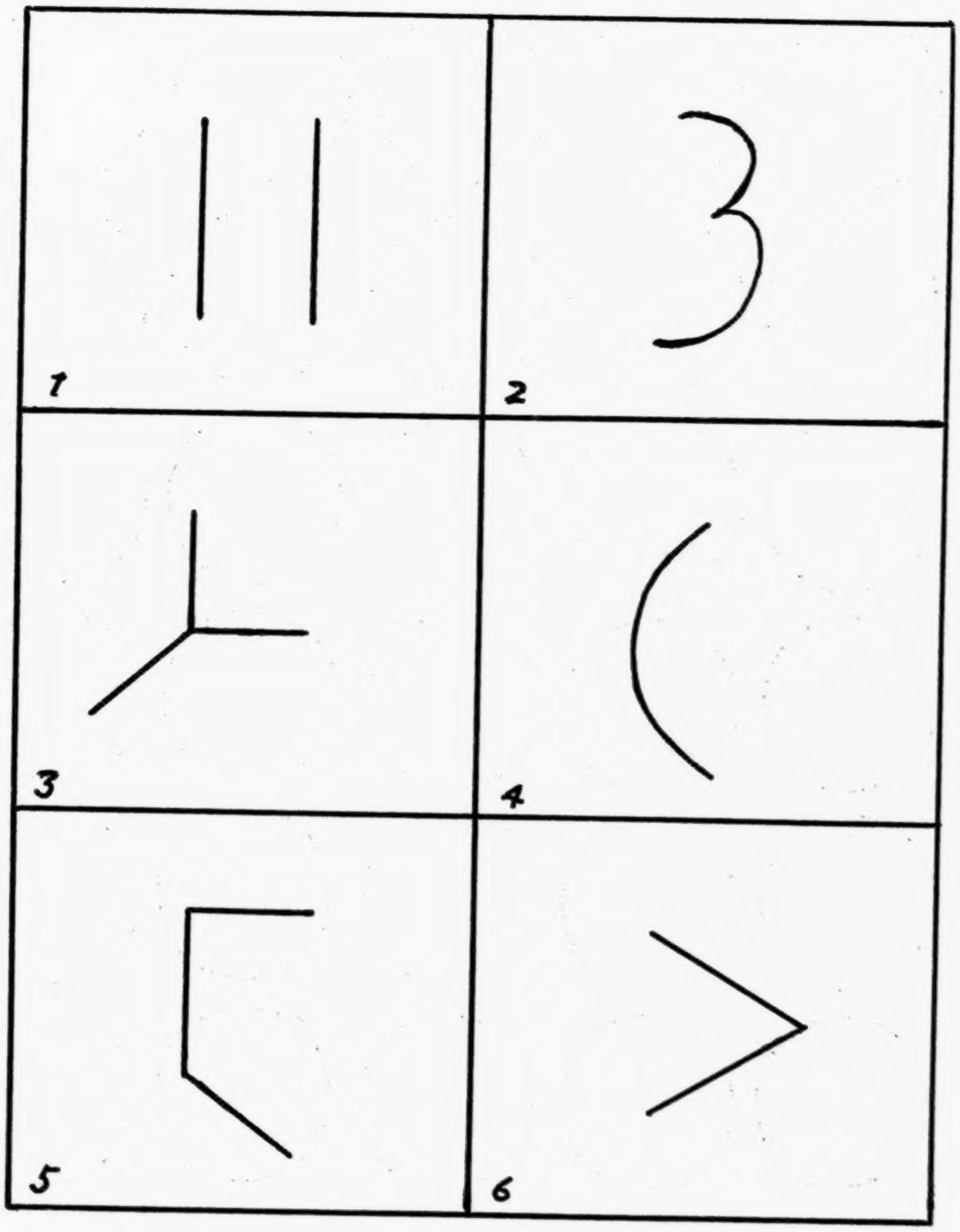
BUREAU OF EDUCATIONAL RESEARCH
University of Minnesota
1960

TASK 1. PICTURE CONSTRUCTION (CURVED SHAPE). You have been given a piece of paper in the form of a curved shape. Think of a picture or an object which you can draw with this form as a part. Then lift up the shape and glue it wherever you want it on this sheet of paper and add lines with pencil or crayon to make your picture. Try to think of something that no one else in this class will think of. Keep adding things onto it, putting into your picture as many interesting ideas as you can. When you have completed your picture, think up a name or title for it and write it at the bottom. (Examiners and teachers should write down the titles for children under the third grade). (10 minutes)

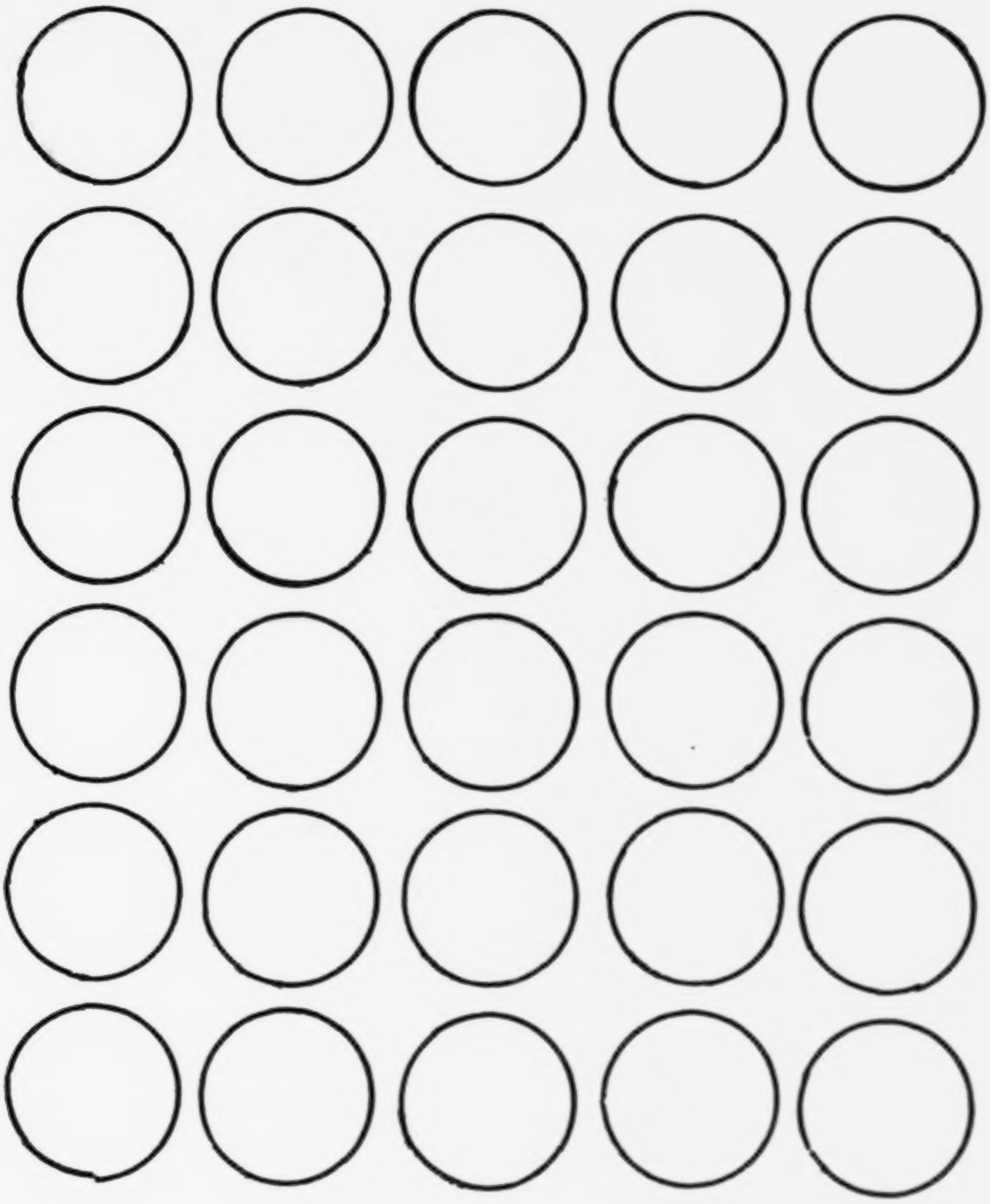


TITLE: ____________________________________

TASK 2. FIGURE COMPLETION. By adding lines to the six figures below, sketch some object or design. Try to think of some object or design that no one else in the class will think of. Try to include as many different ideas as you can in your drawing. In other words, don't stop with your first idea for completing the figure; keep building on to it. Make up a title for each of your drawings and write it at the bottom of each block next to the number of the figure. (10 minutes)



TASK 3. CIRCLES. In ten minutes see how many objects you can make from the circles below. A circle should be the main part of whatever you make. With pencil or crayon add lines to the circles to complete your picture. Your lines can be inside the circle, outside the circle, or both inside and outside the circle. Try to think of things that no one else in the class will think of. Make as many things as you can and put as many ideas as you can in each one. Add names or titles if it is hard to tell what the object is. (10 minutes)



SCORING SCHEMES FOR VERBAL TASKS

Page

Task I: Ask-and-Guess Test; Ask 25

II: Ask-and-Guess Test; Guess Causes 27

III: Ask-and-Guess Test; Guess Consequences 28

IV: Product Improvement (Toy Dog) 33

V: Unusual Uses (Toy Dog) 40

VI: Consequences 44

TASKS I - III: THE ASK-AND-GUESS TEST

Testing Materials

The materials required for the Ask-and-Guess Test include three answer sheets and a picture to serve as the stimulus for the subject's responses. After preliminary testing with several kinds of pictures, the present set of the Mother-Goose Prints[1] depicting children's behavior problems was chosen for the test. These colorful prints or their color slide equivalents seem to be most suitable for subjects of all ages and to arouse curiosity and interest at all age levels.

The first picture of the set is based on the story of Tom, the Piper's Son. Tom is shown running with a black and white pig in his arms and his cap blowing off. The gate of the pig-pen has been left open; one of the remaining pigs is looking up while the others are busy eating. A figure in the background is running toward the pen with a pitch fork in the hand. The dress of the human figures and the structures appear to be of medieval vintage. The second picture is based on the story of "Who put the cat in the well?" A boy is holding a cat over the well. A girl of apparently similar age is looking on and a second boy has turned his back on the scene. In the background is a barn. The remaining two pictures, Little Boy Blue and Little Bobby Shaftoe, have also been used.

Administration Procedures

The test may be administered either orally in an individual situation or written in a group situation. The prints are used in the individual administration and colored slides in the group administration. Having to write out one's ideas seems to inhibit their flow and the two types of administration do not yield identical results (cf. Sagen & Torrance, 1962). Thus far, the test has been administered orally and individually below the fourth grade and in a group situation above this level.

Both in the individual and group administration, a time limit of five minutes for each of the three parts has been imposed.

Subjects are told that this is a test of how curious they are about the world in which they live and of how good they are at guessing causes and results of an event. In introducing the first part, the examiner states that the main way we show our curiosity and obtain information is by asking questions. They are then instructed to think of all the questions they can about what they see in the picture. They are encouraged to ask questions about any or all parts of the picture and of the event depicted but they are, at the same time, cautioned to ask only those questions which cannot be answered by looking at the picture. In asking for hypotheses concerning causes (Part II), subjects are told that they cannot always obtain the information they want by asking questions and that there are times when they must make guesses and then test their guesses through further investigation or study.

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[1] *Mother-Goose Prints*, Penn Prints, New York.

They are then instructed to make all of the guesses they can concerning the possible causes of the event depicted. Similarly for Part III, subjects are instructed to give as many possible consequences (both immediate and long-range) as they can of the action depicted in the picture.

In the oral, individual administration, examiners attempt to form as friendly a relationship as possible with the child and to record his responses as accurately as possible. It would be desirable, of course, to record responses electrically for purposes of further, detailed analyses.

Scoring Procedures

At present, three scores are derived from the test protocols. Scoring procedures for the first two, Fluency and Adequacy, have been kept more or less unchanged since the earliest formulation by Torrance and Radig (1959), while those for the third score, Flexibility, are newly developed here. The possibility of developing procedures for obtaining an originality score is being explored now.

Fluency

A score for fluency is obtained simply by counting the number of responses (questions or guesses), excluding repeated responses only. No concern for relevancy, adequacy, or quality of responses needs to be paid here, except that verbalizations totally foreign to the major purposes and/or function of the testing are not to be regarded as responses to the test. Good examples of these foreign verbalizations are such questions as "Who are you (the examiner)?" or "Are you putting down all of my questions?"

Adequacy

A score for adequacy has required the establishment of a set of simple principles to be followed by scorers.

Part I: Ask. The general rule for scoring the adequacy of a question is: Could the question be answered simply by looking at the picture? If the question cannot be answered by merely looking at the picture, the response is scored as adequate.

Several arbitrary assumptions about the "givens" in the picture are made to further delimit the scope of questions which "cannot be answered by simply looking at it." For Tom, the Piper's Son, these include:

That the pig belongs to the person depicted in the background.
That Tom is taking the pig.
That the other person is chasing Tom.
That the other person has a pitch fork in his or her hand.

Since the story seems familiar to most American children, it would seem that the elimination of questions to obtain such information as above is justified.

The following are typical of the questions scored as *adequate* for Tom, the Piper's Son:

Why is Tom stealing the pig?
Where is Tom taking the pig?
Is Tom scared?
When did this happen?
In what country did it happen?
Why did Tom steal the spotted pig instead of one of the others?
Will the farmer catch Tom?
What will he do to Tom?
Why don't the pigs run out?
Will the boy run back and get his cap?

Examples of *inadequate* responses to Little Bobby Shaftoe include:

Why is the grass green?
Why is the sky blue?
Why is the house brown?

The following are some examples of *adequate* responses to Little Bobby Shaftoe:

Where is the boy going?
Why are they waving to each other?
Is the sun going up or down?
Where do the steps lead? (other side of house)
Is the house near a town?
What country is this?
What year is it?
Is she his mother?

For the picture of Ding Dong Bell, the following could be counted as examples of *adequate* responses:

Is he going to put the cat in the well or is he taking it out?
Who put the pussy in the well?
Why does the girl look scared?
What will they do to the cat?
What does the Z on the barn door mean?

Some examples of *adequate* responses to Little Boy Blue are given below:

Is the little boy dreaming?
Why are they trying to wake him up?
Why is no one working in the field?
Were they playing hide-and-seek?

In scoring the adequacy of questions the scorer must keep in mind the level of knowledge of the child and the implications of questions for determining the action in the picture. Certain facts or relationships may be beyond the grasp of younger children and questions about these facts and relationships which represent curiosity about the picture are scored as adequate. For example: "Why is the grass green?" and "Why is the doorknob white?" are more universal questions not particularly related to the picture; hence they would be scored as inadequate. Conversely, "Why are the sails purple?" "Why is the upstairs window half blue and half white?" "What are those pots on the chimney for?" and "Is the boat coming or going?" would be scored as adequate because they are more related to the picture and represent legitimate curiosity about the picture.

Part II: Guess Causes. Responses are scored as adequate if the explanation reflected "universal, abstract, necessary causes" of the event depicted in the picture. Sequential description of the event which does not include any causal relationships should not be scored as adequate. An example here is: "Morning came. Sun rose and people got up. They ate their breakfast and went to work. The farmer saw Tom taking a pig, so he chased Tom." or "Ship left the harbor. Tide brought it away. The boy is saying good-bye to the girl." In almost all cases, causal explanation centers around the main action shown and this also serves as a criterion of adequacy.

The following are examples of responses judged as *adequate* for Tom, the Piper's Son:

Tom and/or his family were hungry or starving.
Tom was compelled to steal the pig by his parents, gang, or other party.
The pig rightfully belonged to Tom (the farmer had stolen it from Tom; the pig had wandered away; Tom had worked for it; etc.).
Tom wanted it as a pet.
Tom wanted it to sell for money.
Tom bought the pig and the man is waving good-bye.
Tom took the spotted pig because it was the biggest, a boy pig, etc.
Tom just liked to steal.
Tom is playing a joke on the farmer.
Tom disliked the man; revenge.
The farmer wanted to kill the pig and Tom is protecting it.
Tom thought that the farmer was away and that he could get away with stealing the pig.
The farmer wants to give Tom the pitch fork.
The farmer was alerted by the squealing of the pigs or by some chance occurrence.

Examples of *inadequate* responses to Little Bobby Shaftoe include the following:

The grass is green because it's summer.
The steps lead to a porch on the other side of the house.
They just had breakfast.

A couple of examples of *adequate* responses follow:

The boy was sailing away to college.
He was going to get help for his sick mother.
He was going to the store for some bread.

Some *adequate* responses to Ding Dong Bell are:

The cat ate the boy's pet mouse.
The boys put the cat in the well to annoy the girl.
The cat chased the bird and fell in.

Examples of *adequate* responses to Little Boy Blue include:

The boy had been working hard all daylong and could not resist falling asleep.
They were playing hide-and-seek and the boy fell asleep while waiting to be found.
The boy fled from others because they always kid him for his daydreaming.

Part III: Guess Consequences. The rules for scoring the adequacy of consequences are essentially the same as those for scoring causes. The consequence must follow as a logical outcome of the behavior in the picture to be considered adequate. Results of the action described or implied in the stimulus picture should be explicitly stated.

In rare cases, subjects give sequential stories without any clear distinction between one response item and another. In scoring this kind of story, each unitary act or action in the story is deemed as a separate response and thus adjudged according to the foregoing criterion. For example, a sequential story such as "Tom took the pig to a state fair and got the first prize. With the prize money, he started breeding many pigs and became very rich. He got married to a beautiful girl and lived happily ever after" is regarded as consisting of six unitary actions and scored accordingly. If, in a sequential story such as above, the first act is not a logical consequence, the first response is not scored as adequate but succeeding responses are considered adequate if they follow from the first.

The following are some examples of *adequate* responses to Tom, the Piper's Son:

Tom was (was not) caught.
The pig got (did not get) away.
Tom was punished (scolded, spanked, put to bed without supper, compelled to work for the farmer, put in jail, etc.).
Tom was forgiven by the farmer.
The farmer gave Tom the pig.
Tom was expelled from school.
Tom had escaped from prison and got caught again for stealing.
Tom kept stealing more and more.
Tom was scared, amused, angry, etc.
The other pigs ran away.
The man tripped and fell.
The man became exhausted because of overweight.
Tom learned lesson and never stole again.
The farmer is jailed for assaulting Tom.

Examples of *inadequate* responses for Little Bobby Shaftoe include the following:

The sun went down.
The trees died.
Some other people bought the house and cut down the trees.

Examples of *adequate* responses to Little Bobby Shaftoe follow:

A storm came and the ship sank.
The boy waved so hard that he fell overboard and drowned.
The boy found some treasure, came back and married the girl, and they lived happily ever after. (An adequacy score of four will be given.)
The girl became lonely and left to marry another man. (two points).

Some *adequate* responses to Ding Dong Bell are given below:

The cat might catch a cold and die.
The cat will scratch the boy.
The girl will tell her mother what her brother did.
The boy might be punished by the owner of the well.

Responses regarded *adequate* for Little Boy Blue include the following:

The boy will be surprised and start fighting with them.
They start playing hide-and-seek all over again.
The boy will keep sleeping no matter what they try to wake him up.
This boy will fall down and break his leg.

Flexibility

A score for flexibility is the "number of runs" in terms of the grammatical subjects in given responses. Every response, whether it is adequate or not, should be analyzed in terms of its grammatical subject for this purpose, with the only exception of repeated responses. After determining what or whom the sentence is all about for every response, count the number of *runs* for each part of the test and, then, combine these three Flexibility subscores to obtain a single, total Flexibility score for the entire Ask-and-Guess Test. For instance, Example A below consists of seven *runs* (Flexibility: seven points) while Example B is made up of eight *runs* (Flexibility: eight points).

		Example A	*Example B*
Response	1	The (spotted) pig........Run 1	The boy
	2	The (spotted) pig	The boy.................Run 1
	3	Tom (the boy)............Run 2	The boy
	4	The (spotted) pig........Run 3	The man (farmer).. Run 2
	5	The boy......................Run 4	The pig..................Run 3
	6	The boy and pig..........Run 5	The pig
	7	Other pigs...................Run 6	The man................Run 4
	8	The boy......................Run 7	The boy.................Run 5
	9		The man................Run 6
	10		It (the weather)......Run 7
	11		The pig..................Run 8

By paying attention to *runs*, it would seem that we can closely observe how a person's flow of thought shifted back and forth from one category to another over time and, therefore, come up with a better measure of flexibility of ideas than the traditional one which merely counted the number of different categories of responses without paying any attention to the temporal factor or to the process of development and shifting of ideas over time.

In complex sentences, grammatical subjects of the independent clauses, instead of those of the dependent or subordinate clauses, should be picked out for counting *runs*. The following examples will make this and other points clear:

Example C (Flexibility: nine points)

Response 1 Why is ***the man*** chasing him? .... Run 1
2 Why did ***he*** (Tom) take the spotted pig?
3 Why did ***he*** take any pig? .... Run 2
4 Why is ***he*** afraid of the man?
5 Why does ***the boy*** want a pig?
6 Does ***the man*** own the pigs? .... Run 3
7 Why does ***the pig*** stay there? .... Run 4
8 Do ***the pigs*** eat a lot? .... Run 5
9 Why does ***the man*** have a pitchfork?
10 Is ***the man*** mad at the boy? .... Run 6
11 Will ***the man*** miss the pig or is he rich?
12 Does ***the man*** have other pigs?
13 Will ***the boy*** get caught with the pig? .... Run 7
14 Does ***the boy*** like the man?
15 Does ***the man*** like the boy? .... Run 8
16 What ***time*** was it? .... Run 9

Example D (Flexibility: six points)

Response 1 ***The farmer*** stole the pig from the little boy .... Run 1
2 ***The boy's family*** was hungry .... Run 2
3 ***The mother pig*** wouldn't take care of that pig because it was different, so the boy wanted to care for it .... Run 3
4 ***The boy's own pig*** was killed so he wanted another one .. Run 4
5 ***The boy*** just happened to be walking by .... Run 5
6 ***The pig*** is sick and the boy is taking it to a doctor .... Run 6

Example E (Flexibility: eight points)

Response 1 ***The pig*** will bring a good price at market .... Run 1
2 ***The boy*** won't be hungry .... Run 2
3 ***The pig*** will die .... Run 3
4 ***The boy*** will go to jail .... Run 4
5 ***The pig and the boy*** will have a nice vacation .... Run 5
6 ***The pig*** runs home by itself .... Run 6
7 ***The other pigs*** escape .... Run 7
8 ***The gate*** closes by itself .... Run 8

A couple of additional points need to be clarified. First, a compound sentence, if it is a real compound sentence, could give more than one Flexibility point because each of the composing sentences has its own grammatical subject. However, to keep our scoring procedures simple, it is proposed that the grammatical subject of the sentence expressing the most basic or causative event (s) should be picked out. Application of this principle is seen in Example D (Responses 3, 4, and 6).

Second, a simple operation of switching minor parts of sentences without affecting the major structure of these sentences, *when carried out in succession in more than one response,* should be counted as constituting one, and only one, *run* even though these sentences might have different grammatical subject. This point should be clear from Example F below:

Example F (Flexibility: four points)

Response	1	What is *the man's name*?	
	2	What is *the boy's name*?	Run 1
	3	What is *the pig's name*?	
	4	What longitude is *the sty* at?	Run 2
	5	What latitude is *the sty* at?	
	6	How old are *the pigs*?	
	7	How old is *the boy*?	Run 3
	8	How old is *the man*?	
	9	How much food does *the pig* eat?	
	10	How much food does *the boy* eat?	Run 4
	11	How much food does *the man* eat?	

Originality

A score for originality is now being worked upon and a complete scheme is yet to be developed. When the scheme is established in the near future, a score for originality will be defined as the *sum of the weighted scores* given each response according to the basic relationships revealed. Since every picture we have ever used as our stimulus depicts, in addition to various inorganic items and organic beings, more than one person in action, categories shown in Table 1 seem to cover all the possible relationships revealed in subjects' responses.

Table 1

Categories to be Used in Proposed Scoring for Originality (Ask-and-Guess)

Categories for Originality	Relationships Revealed	Examples of Response	Weight[1]
Personal	Individual person	"Is Tom scared?"	
	Individual animal	"He was hungry."	
		"The pig will squeal."	
Interactional	Person x Person	"Tom hated the farmer."	
	Person x Animal	"He was cruel to the pig."	
	Animal x Animal	"Cat chased the bird."	
Situational	Environmental set up	"Where does this happen?"	
	Things x Person	"He picked up his cap."	
	Things x Animal	"The bird hit the chimney and fell."	
	Things x Things	"Wind blew up the roof."	

[1] Weight should be determined on the basis of frequencies with which these different relationship patterns are revealed in responses of an adequate reference group.

TASK IV: PRODUCT IMPROVEMENT TASK

Testing Materials

The materials required for the Product-Improvement Task include an answer sheet and a small stuffed toy dog or monkey. The toy dog was selected for its appropriateness for both boys and girls. The model selected is a small one covered with red and blue velvet. The tail is very short; the long, droopy ears are of black velvet; the nose is of a hard black substance; and the eyes are made of yellow and blue felt. A thin green ribbon decorates the neck. The toy monkey is about the same size as the toy dog and similarly constructed. Neither of these seemed to have any "sex taint" in our experimental work in contrast to other toys such as a nurse kit and a friction fire truck which were also used experimentally.

Administration Procedures

The task must be administered individually to children in the early school years but may be administered as a group task to other children, adolescents, and adults. A time limit of eight minutes is placed on both oral and written testings. In the group administration, a color slide is used but it is still desirable to display the toy itself to give subjects a notion about its actual size.

The instructions for the oral administration are as follows: "Try to think of the cleverest, most interesting, and most unusual uses you can for changing this toy dog (monkey) so that boys and girls will have more fun playing with it. Don't worry about how much it would cost -- just so it would make it more fun to play with. As fast as you think of ideas, tell them to me and I'll write them down for you."

The instructions for the group administration are as follows: "List below the cleverest, most interesting, and most unusual uses you can think of for changing the toy dog (monkey) you will be shown so that children will have more fun playing with it. Don't worry about how much it will cost -- just so it would be more fun to play with."

Scoring Procedures

Four scores, Fluency, Flexibility, Originality, and Elaboration are derived from results of the test. Except for the first of these, Fluency, all of the scores are defined here anew.

Fluency

A score for fluency is obtained simply by counting the number of all responses given, excluding only those which are irrelevant or repeated.

Flexibility

In deriving our new score for flexibility, we tried to integrate two ideas, *principles* and *runs.* One of the most logical ways to classify multitudinous responses is to do it according to a small number of basic principles and this idea has been utilized in the old flexibility score. In addition to this, we would pay attention to how a subject's flow of ideas develops and changes along the time axis and, for this purpose, we turn to the concept of runs.

The Flexibility score, as defined here, is the *number of runs* revealed in response *in terms of* the following three *principles* (or processes).

1. *Manipulation* (denoted as *M*): Any operation which can be effected while keeping the toy as it is (intact in its static state). Thus defined, this principle includes all of the following principles so far differentiated: Addition, Color Change, Combination, Multiplication, Position, Substitution, and Subtraction.

This principle is seen in responses such as follows:

> Give him a hat; give him a collar; put a leash on him; and the like. (Change in accessories)
> Change color into red; white and brown spots; red nose; and the like. (Change in color)
> Turn him around and let him stand on his head; and the like. (Change in orientation)
> Give him a dog family; add a couple of puppies; and the like. (Change in number)

2. *Alteration* (denoted as *A*): Any operation which cannot be effected without causing overhauling, redesigning, or total reprocessing of the toy in its static state. Thus defined, this principle includes all of the following principles previously identified: Adaptation, Division, Magnification, Minification, Material Change, Rearrangement, Reversal, Shape Change, Smell Appeal, and Touch Appeal.

Application of this principle is found among the following examples:

> Make it bigger; make him six feet tall; and the like. (Change in dimension)
> Make him look happier; make him stand; give teeth; and the like. (Change in design).
> Make him out of plastic; rubber nose, and the like. (Change in material)
> Use him as a doggy bank; use him in a play; and the like. (Change in use)
> Change him into a bear, deer, elephant, and the like. (Change in kind)

3. *Dynamism* (denoted as *D*): Any dynamic operation which animates the toy (or its converted equivalent). Thus defined, this principle includes the following three principles previously identified: Ear Appeal, Eye Appeal, and Motion.

The following are some of the examples of application of this principle:

Make him bark; let him walk; and the like (Simple animation).

Put a squeaker in him - squeak when squeezed; wind his tail and he barks (Change in mechanism).

Each response is to be classified into one of these three categories, Manipulation (superficial change), Alteration (change, but static), and Dynamism (change, dynamic), and denoted by either one of the three symbols, M, A, or D. The Flexibility score is obtained by counting the number of runs in terms of these three symbols. Example G below will, therefore, merit a score of three for flexibility and Example H, seven.

Example G (Flexibility: 3)

Response	1	M	Run 1
	2	M	
	3	D	Run 2
	4	A	
	5	A	Run 3
	6	A	

Example H (Flexibility: 7)

Response	1	A	Run 1
	2	M	Run 2
	3	A	Run 3
	4	A	
	5	D	Run 4
	6	M	
	7	M	Run 5
	8	M	
	9	A	Run 6
	10	D	Run 7

Also see Examples I through L (pages 37 - 39) for further illustration.

Originality

In deriving the score for originality, we tried again to combine two ideas thus far employed, classification according to *principles* and *weighting* according to response frequencies. The former was utilized in deriving our old Inventivelevel score and the latter, old Originality.

The Originality score, as defined here, is the sum of the *weighted scores* given each response *according to the basic principles* (or operations) revealed. Table 2 presents these principles classified under each of the three categories used in deriving Flexibility and weights to be given to each of these. These weighted scores were based upon the frequencies with which each of these principles was used in responses gathered from 146 pupils in an elementary school (grades one through six) and 448 students in a high school (grades seven through twelve), both in Minneapolis.

Table 2

Principles to be used in Scoring for Originality (Product Improvement) and Weights to be Given

Principles for Flexibility	Principles for Originality	Scoring Weight[1]	Frequency[2] f	%
Manipulation (*M*)	No change	0	0	0
	Change in Accessories	1	1138	21.5
	Change in Color	3	238	4.5
	Change in Orientation	3	160	3.0
	Change in Number	3	47	0.9
			1583	29.9
Alteration (*A*)	Change in Dimension	2	685	12.9
	Change in Design	2	589	11.1
	Change in Material	2	499	9.4
	Change in Use	3	69	1.3
	Change in Kind	3	13	0.2
			1855	35.0
Dynamism (*D*)	Simple Animation	1	1108	20.9
	Change in Mechanism	2	751	14.2
			1859	35.1
		Total	5297	100.0

[1] Weights were decided as follows: weight = 1, if frequency $\geq$ 15%
weight = 2, if 15% $>$ frequency $\geq$ 5%
weight = 3, if requency $<$ 5%

[2] Based upon responses from 146 pupils of grades one through six and 448 students of grades seven through twelve.

Examples I through L below would clarify actual scoring procedures on Originality. When and if two or more principles apply equally well to a response, choose the principle which gives the highest possible score among them. Each response should be classified in one, and only one, of these categories and, therefore, weighted scores should not be summed over the two or more principles equally applicable to a response.

Elaboration

Each response is further considered for its elaborateness and given either two or one points. The rule is a simple one and states: To obtain an Elaboration score of two, a response must tell you specifically *what for (why)* or *how* or *what with* of the operation proposed.

A score for Elaboration is thus obtained simply by summing up these points for all the responses. Example I through L will clarify actual scoring procedures further which are much simpler than they sound. In these examples, similar responses are placed side by side for the purpose of comparison but, otherwise, the actual scoring procedures were followed in them. It will be noted that all four scores, Fluency, Flexibility, Originality, and Elaboration, can be obtained by a single inspection of responses given.

Example I (Fluency: 18; Flexibility 12; Originality 32; Elaboration 26)

Response	1	Have a hat with the dog's ears pulled through	M-1-2[1]	(Accessories)
	2	Put a hat on its head	M-1-1	(Accessories)
	3	Have it bark (or Make it walk)	D-1-1	(Animation)
	4	Make it out of rubber	A-2-2	(Material; specified)
	5	Make it furry.	A-2-1	(Material)
	6	Larger	A-2-1	(Dimension)
	7	Put a small basket around its neck with candy in it	M-1-2	(Accessories; specified)
	8	Make it able to be taken apart and put together again.	A-2-1	(Design)
	9	Wire it with batteries so the eyes light	D-2-2	(Mechanism;specified)
	10	Make it squeak when squeezed	D-2-2	(ibid.)
	11	Change color to brown.	M-3-2	(Color; specified)
	12	Have his nose light up	A-2-1	(Design)[2]
	13	Make his eyes change color when he is in the dark	D-1-1	(Animation)[2]
	14	Give it a mechanical walk	D-2-1	(Mechanism)
	15	Put it on wheels	A-2-1	(Design)[2]
	16	Put a large red light in its nose	A-2-2	(Design; specified)[2]
	17	Add eyelashes	M-1-1	(Accessories)
	18	Make the head removable so it can be used as a bank	A-3-2	(Use; specified)

[1] The first letter stands for Flexibility category; the second number, for Originality weight; and the third number, for Elaboration.

[2] Unless an operation makes the toy dog more similiar to or resemblant of the *real* dog, the operation should not be classified as Animation and unless a response clearly points to an active orientation to change the mechanism, it should not be classified as Mechanism.

Example J (Fluency 13; Flexibility 10; Originality 24; Elaboration 20)

Response	1	Make eyes so they can move (eyeball)	D-1-1	(Animation)
	2	Make it look happy.	A-2-1	(Design)
	3	Make its tongue wag when it has been moving	D-1-2	(Animation; specified)
	4	Put a noise box in it (or Give him a squeaker)	A-2-1	(Design)
	5	Put a noise maker in it so that it can bark	D-2-2	(Mechanism;specified)
	6	Put in an electric buzzer	A-2-2	(Design; specified)
	7	Give it a name	M-1-1	(Accessories)
	8	Put candy inside of it	A-3-1	(Use)
	9	It should be a wind-up dog	A-2-1	(Design)
	10	Could have a wind-up motor to propel it	D-2-2	(Mechanism)
	11	The ears should wave a little when the head bends down to sniff or drink water from a bowl that comes with the kit	D-1-2	(Animation; specified)
	12	Make it into rubber for babies to chew on	A-3-2	(Use)[1]
	13	Make it of plastic to play with in the water	A-2-2	(Material)

Example K (Fluency 11; Flexibility 6; Originality 28; Elaboration 19)

Response	1	Give it eyes that move (in enclosed capsules)	D-1-2	(Animation)
	2	Make a complete "dog community" to romp in	M-3-1	(Number)
	3	Cut a door in the back and use it for a lunch box.	A-3-2	(Use)
	4	Sell it with froth in the mouth and an information booklet on rabies	A-3-2	(Use)
	5	Make it an autograph dog	A-3-1	(Use)
	6	Make a family of dogs	M-3-2	(Number)

---

[1] Use (3 points) was chosen over Material (2 points) according to the previously stated rule on scoring (see page 37).

7	Make it so they could have him in other positions	M-3-1	(Orientation)
8	Put on a black collar with jewel	M-1-2	(Accessories)
9	Make tongue pull out and have music	A-2-2	(Design)
10	Change the color to purple	M-3-2	(Color)
11	Have a smaller dog, also on wheels, attached behind it	M-3-2	(Number)[1]

Example L (Fluency 7; Flexibility 3; Originality 10; Elaboration 9)

Response	1	Put a long tail on it	A-2-1	(Design)
	2	Put a long tail standing up	A-2-2	(Design)
	3	Have his eyes movable (or Make him so that he can move his eyes)	D-1-1	(Animation)
	4	Give him a device so that he can walk	D-2-1	(Mechanism)
	5	Give him something so he can yawn	D-1-1	(Animation)
	6	Make him walk when you squeeze tail	D-2-2	(Mechanism)
	7	Make as a toy for a trip	M-0-1	(No change)

---

[1] Number was chosen over Design. The former will give 3 points while the latter, 2 points.

TASK V: UNUSUAL USES

Testing Materials

The materials required for the Unusual Uses include an answer sheet and a small stuffed toy dog or monkey which is the same as that described in Task IV (page 33).

Administration Procedures

The task can be administered orally and individually or written and in a group. The instructions for the oral administration are as follows: "Think of the cleverest, most interesting, and most unusual uses you can for this toy dog (monkey) other than as a plaything. These uses can be for the toy as it is or as it can be changed. For example, you could use it as a pin cushion as it is. Or, you could make it larger and stronger and use it to sit on. Think of as many uses as you can and tell them to me."

In the group administration, the instructions are as follows: "List below the cleverest, most interesting, and most unusual uses you can think of for this dog other than as a plaything. Think of uses as it is or as it could be changed. For example, it could be used as a pin cushion as it is. If, on the other hand, you make it larger and stronger, you could use it to sit on."

A time limit of five minutes is placed upon this task for both individual and group testing.

Scoring Procedures

Four scores, Fluency, Flexibility, Originality, and Elaboration are derived from test responses. Except for the first of these, Fluency, all of these scores are defined here anew.

Fluency

A score for fluency is obtained simply by counting the number of all responses given, excluding only those repeated in an identical or essentially identical form.

Flexibility

The two concepts used in scoring the Product Improvement Task, namely, *principles* and *runs*, are utilized here too.

Flexibility score, as defined here, is the *number of runs* revealed in responses *in terms of* the following three *principles* (or purposes).

(1) Ornamental-Household (denoted as *O*): Any method of utilizing the toy dog (monkey) for more or less decorative and/or household purposes.

(2) Container-Holder (denoted as *C*): Any method of utilizing the dog (monkey) for containing or holding some material without, however, involving any dynamic feature (energy supply).

(3) Scientific-Mechanical (denoted as *S*): Any method of utilizing the dog (monkey) for uses which involve more or less self-containing energy sources and/or possible movememt.

Each response is to be classified into one of these three categories, O, C, or S, and, then, Flexibility is obtained quite easily by counting the number of runs in terms of these three symbols. Actual scoring procedures will be clarified by Example M through O (pages 42 - 43).

Originality

The same two concepts utilized in scoring the Product Improvement Task, namely, *principles* and *weighting*, were employed here too.

Originality, as defined here, is the *sum of the weighted scores* given each response *according to the basic principles* (or operations) revealed. Table 3 presents these principles classified under each of the three categories used in deriving Flexibility and weights to be given to each of these. These weighted scores were based upon the frequencies with which each of the principles was used in responses gathered from 146 pupils in an elementary school (grades one through six) and 448 students in a high school (grades seven through twelve) both in Minneapolis.

Table 3

Principles to be Used in Scoring for Originality (Unusual Uses) and Weights to be Given

Categories for Flexibility	Principles for Originality	Scoring Weight[1]	Frequency[2]	
			f	%
Ornamental-Household (*O*)	No change	1	919	28.3
	Change in Materials	1	693	21.3
	Change in Dimension	1	554	17.1
			2166	66.7
Container-Holder (*C*)	No change	2	412	12.7
	Change in Materials	2	303	9.3
	Change in Dimension	3	126	3.9
			841	25.9
Scientific-Mechanical (*S*)	Static	2	180	5.5
	Dynamic	3	61	1.9
			241	7.4
		Total	3248	100.0

[1] The same scheme can easily be applied to other Unusual Uses tasks such as "Tin Cans" by simply replacing these weights with new sets of weights suitable for respective tasks.

[2] Based upon responses from 146 pupils of grades one through six and 448 students of grades seven through twelve.

Examples M through O below would clarify the actual scoring procedures. When and if two or more principles apply equally well to a response, choose the principle which gives the highest possible score among them.

Elaboration

Each response is further considered for its elaborateness and given either two or one points. The rule is a simple one and states: To be given an Elaboration score of two, a response must tell you specifically *what for (why)* or *how* or *what with* of the operation proposed and/or of the resulting new product.

A score for Elaboration is thus obtained simply by counting the number of all the responses which were given either two or one points for their elaborateness (in its exploration of the principle or operation involved and/or of the resulting product). Examples M through O will clarify actual scoring procedures in which all four scores, Fluency, Flexibility, Originality, and Elaboration, can be obtained by a single inspection of responses given.

Example M (Fluency 11; Flexibility 6; Originality 17; Elaboration 17)

Response	1	Mascot	O-1-1[1]	(No change)
	2	Centerpiece	O-1-1	(No change)
	3	Conversation piece	O-1-1	(No change)
	4	Make it bigger and have it as a T.V. stool for children	O-1-2	(Dimension; specified)
	5	Have several and put them in a game booth and knock them down	O-1-2	(No change; specified)
	6	Have it as a tape measure using tongue or tail	C-2-2	(No change; specified)
	7	Make him movable and able to obey you	S-2-1	(Static)[2]
	8	Salt or pepper shaker	C-2-1	(Material)[3]
	9	A prize for a child's party	O-1-2	(No change)
	10	Make bigger - use for a "hat-holder"	C-3-2	(Dimension)[4]
	11	Use as watering can with water coming from tongue	C-2-2	(Material; specified)[3]

[1] The first letter stands for Flexibility category; the second number, for Originality weight; and the third number, for Elaboration.

[2] When the product of a proposed scientific-mechanical change does not suggest any spontaneous movement or *when no explicit mention is made of the energy source,* the response should be categorized as "static." See, also, Example N.

[3] In many responses, change in materials or dimension is implied rather than explicitly stated. If explicitly stated, the response is scored for Elaboration.

[4] Dimension (3 points) was chosen over implicit Material (2 points).

Example N (Fluency 9; Flexibility 4; Originality 19; Elaboration 15)

Response	1	Flashlight	S-2-1	(Static)
	2	Make it larger, with a hollow back, and put it on wheels and use it for a wagon	S-2-2	(Static)
	3	Make him into a robot	S-2-1	(Static)
	4	With a long tail he can be used as a whisk broom	O-1-2	(Dimension)
	5	As a music box on a bed	S-2-1	(Static)
	6	For music box wind from a long tail	S-3-2	(Dynamic)
	7	Have it hanging from a light socket and when light goes nose lights up	S-3-2	(Dynamic)
	8	Magnetized - holds pencils to side	S-3-2	(Dynamic)
	9	A distractor for a photographer while taking pictures	O-1-2	(No change)

Example O (Fluency 13; Flexibility 6; Originality 26; Elaboration 19)

Response	1	If larger - a riding thing for small children	O-1-2	(Dimension)
	2	If taller - a holder of flowers for hair	C-3-2	(Dimension)
	3	Holder of earrings	C-2-1	(No change)
	4	Holder of hair clips	C-2-1	(No change)
	5	Have its head bowlish at the top and use it as an ash tray	C-2-2	(Material)
	6	Squirt gun	C-2-1	(Material)
	7	A bank that has a date and every time you put money in it the date changes	S-3-2	(Dynamic)[1]
	8	Use as a clock	S-2-1	(Static)
	9	Use as a toy car	S-2-1	(Static)
	10	If larger use as a purse	C-3-1	(Dimension)
	11	Weight it and use for a paper weight	O-1-2	(Material)
	12	Make it six feet tall and use it for a hat rack	O-1-2	(Dimension)
	13	A cigarette lighter	S-2-1	(Static)

[1] "Scientific-mechanical: Dynamic" category was chosen over that of "Container."

TASK VI: CONSEQUENCES

Testing Materials

The material required for the Consequences task is simply an answer sheet. The three improbable situations used are sometimes referred to as belonging to Form A of the test, while the following three make up Form B.

1. What would happen, if our days were twice as long as they are?
2. What would happen, if a man could live forever on the earth?
3. What would happen, if men could fly without mechanical aids?

There also is a variety of this test under the name of the "Just Suppose" test in which interesting drawings were used to suit its use for younger subjects.

Administration Procedures

The administration of this task has so far been done in a group situation only with a time limit of five minutes for the three problems. The instructions given are as follows: "In the spaces below list all of the possible consequences you can think of for each of the improbable events or conditions listed below."

Scoring Procedures

Four scores, Fluency, Flexibility, Originality, and Elaboration are to be obtained from results of the test. For the present, however, only two of these, Fluency and Flexibility, are derived, while scoring schemes for the remaining two are being worked upon. The principles to be employed in developing such schemes are the same as those used in scoring the foregoing tasks and, hence, the systematic approach adapted in this paper will not be affected by any later development.

Fluency

A score for fluency is obtained simply by counting the number of all responses given, except those repeated in an identical or essentially identical form.

Flexibility

A score for flexibility is derived in exactly the same fashion as that used in deriving Flexibility for the Ask-and-Guess Test (page 29). Flexibility, as defined here, is, therefore, the number of *runs in terms of* the grammatical subjects used in given responses. Every response, adequate or not, should be analyzed in this way, except only those responses repeated more than once. By counting runs, we can follow the line of thoughts of a subject in a much better fashion than achieved thus far in any other scoring scheme. For more details and examples, turn to descriptions given earlier.

Originality

When our scoring scheme is completed in the near future, a score for originality will be the *sum of the weighted scores* given each response *according to the basic principles* (or changes) revealed. Possible categories of these principles are shown in Table 4 which should be completed with weights to be given.

Table 4

Principles to be Used in Scoring for Originality (Consequences)

Principles for Originality	Example of Response	Scoring Weight [1]
Indifference	Self-evident results Mere restatement of the problem	
Integrative: Self-centered	"I" will be happy "I" become a friend of animals	
Integrative: Others-centered	General or social effects People become rich Scientific knowledge enhanced New products hit the market Animals attend school	
Disintegrative: Self-centered	"I" feel sorry, mad, etc. "My" things will be robbed	
Disintegrative: Others-centered	Lawlessness, robbery, murder, etc. The earth will be destroyed	

Elaboration

Each response will further be considered for its elaborateness and given either one or two points. The same, simple rule used before will be employed for this purpose: To be given an Elaboration score of two, a response must tell you specifically *why(what for)* or *how* or *what with* of the consequences suggested.

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[1] Based upon frequencies of the principles revealed in responses given.

SCORING SCHEMES FOR NONVERBAL TASKS

Page
Task I: Picture Construction 48
II: Figure Completion 54
III: Circles 62

TASK I: PICTURE CONSTRUCTION

Testing Materials

The materials required for the Picture Construction task are a plain answer sheet and a curved sheet of colored paper attached therewith. These are shown in page 20. The curved shape measures 2 x 4-1/2 inches and backed with glue. A variety of bright colors have been used.

Administration Procedures

The task has so far been administered in a group situation with a time limit of ten minutes. The instructions given are as follows: "You have been given a piece of paper in the form of a curved shape. Think of a picture or an object which you can draw with this form as a part. Then lift up the shape and glue it wherever you want it on this sheet of paper and add lines with pencil or crayon to make your picture. Try to think of something that no one else in this class will think of. Keep adding things onto it, putting into your picture as many interesting ideas as you can. When you have completed your picture, think up a name or title for it and write it at the bottom." For the lower grades (up to the third) the last sentence in the instructions is omitted and the examiners and teachers will write the title for them.

Scoring Procedures

Three scores, Originality, Elaboration, and Activity, are derived from responser. Additional scores, Title Adequacy, and Originality are now being developed to evaluate the titles given in this task.

Originality

A score for originality is determined by the principle with which a subject utilized the colored sheet in making up his picture. Table 5 presents the fundamental principles (categories) to classify a response into and weighted scores to be given.

"Simple figure" in Table 5 represents those uses of the colored sheet in which no addition to speak of was made to the sheet in constructing a picture. Quite often, the colored sheet is simply pasted on the answer sheet without any elaboration whatsoever and a title given thereto. For example:

Simple figure..........	Life-Nature............	Cloud, pond, lake, sun, potato, jelly bean, caterpillar
	Ornamental- Household	Hot dog, hat, rug, cigar, bread, pool, bathtub, shoe, cake
	Scientific- Mechanical	Boat, canoe, sleigh, motorboat, bomb

Table 5

Principles to be Used in Scoring for Originality (Picture Construction) and Weights to Be Given

Category	Principles Involved	Scoring Weight[1]	Frequency[2] f	%
Life-Nature (*L*)	Simple figure	10	37	9.4
	Structural part	5	99	25.2
	Field	10	31	7.9
			167	42.5
Ornamental-Household (*O*)	Simple figure	10	79	20.1
	Structural part	10	20	5.1
	Field	15	5	1.3
			104	26.5
Scientific-Mechanical (*S*)	Simple figure	5	64	16.3
	Structural part	10	53	13.5
	Field	15	5	1.3
			122	31.1
		Total	393	100.0

"Structural part" covers those responses in which the colored sheet was used in such a fashion as to make it a part of a larger structure. Often, simple additions are effected on the sheet to make, for example:

Structural part	Life-Nature	Human or animal body, tree, human mouth
	Ornamental-Household	Umbrella, roof of a house, candy-machine, flower-pot, collar, candle-holder, skirt
	Scientific-Mechanical	Bus, airplane, rocket, submarine, glasses, direction-signal, iron, pump, robot, roller, train, wagon

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[1] Weights were determined as follows: Weight = 5, if frequency $\geq$ 15%
Weight = 10, if 15% $>$ frequency $\geq$ 5%
Weight = 15, if frequency $<$ 5%

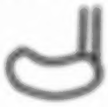
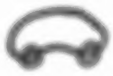
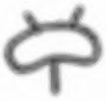
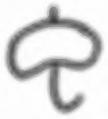
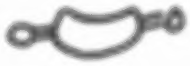
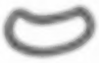
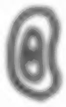
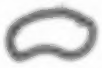
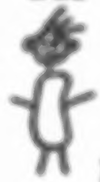
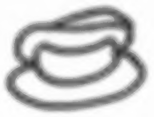
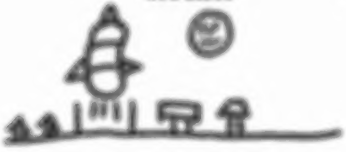
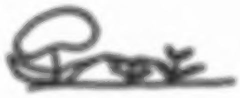
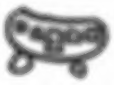
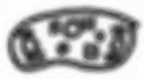
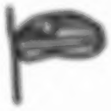
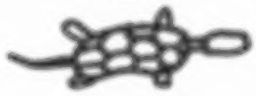
[2] Based upon responses gathered from 223 pupils in kindergarten through sixth grade of an elementary school in Minneapolis. Under the particular testing condition, every subject was asked to construct up to three pictures with three sheets of colored paper.

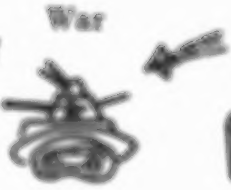
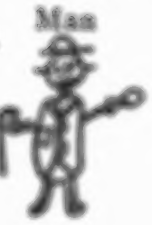
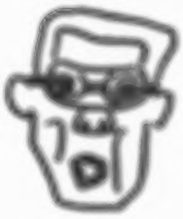
"Field" covers those responses in which the colored sheet was used as field for a figure inside of it. Examples include:

Field	Life-Nature	Human or animal face, garden
	Ornamental-Household	Cage, design, flag, target
	Scientific-Mechanical	Highway, traffic-signal, race track, thermometer, tunnel

Elaboration

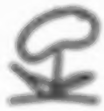
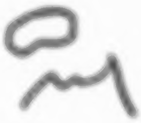
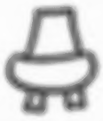
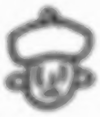
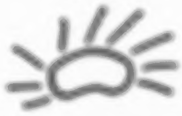
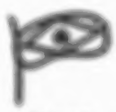
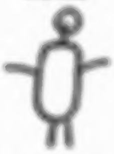
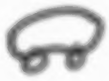
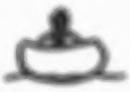
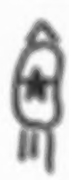
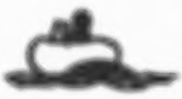
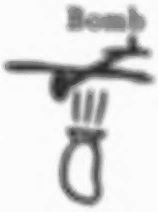
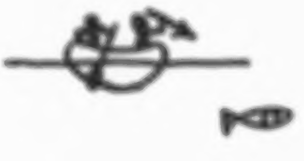
A response is further considered for its elaborateness and given a score according to the following scheme.

Score	*Description*	*Example*
0	No elaboration beyond the minimum essentials to represent and convey what a subject has in mind	Leg or Shoe  Car  Hotdog  Umbrella  Rolling pin  Lake  Target  Cloud 
5	Elaboration of picture elements *outside* of the colored sheet	Man Dad  Hotdog  Rocket  Flower 
10	Elaboration of picture elements *inside* of the colored sheet	Bus  Top view of a table  Flag  Turtle 

15	Elaboration of picture elements both *inside and outside* of the colored sheet	War 	Man 	Pair of glasses 

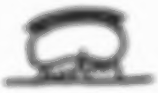
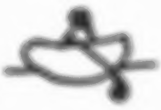
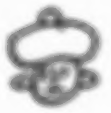
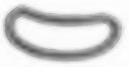
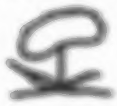
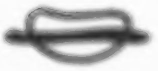
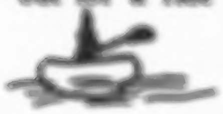
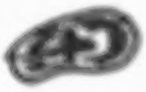
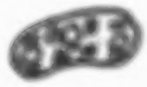
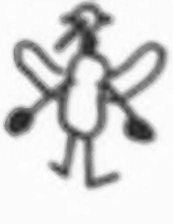
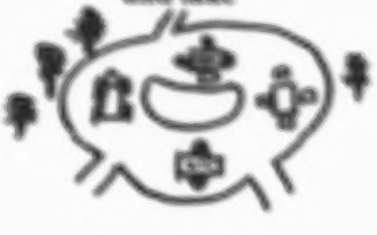
Activity

The third score to be given a response is that of Activity. This is intended to be a measure of dynamic orientation and a production is thus judged for its dynamic or static features. The criteria to be used are as follows:

Score	*Description*	*Example*		
0	Static	Flower 	Cloud 	Chair 
		Hat 	Sun 	Flag 
5	Activity implied	Man 	Car 	Boat 
10	Activity shown	Rocket 	Boat 	Bomb 
			Indians 	

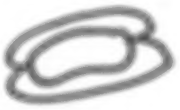
Title Adequacy

A score for title adequacy is now in the process of being developed and the following scheme is temporarily suggested. In scoring for this dimension, a scorer should pay his attention primarily to titles given and judge them for their expressiveness.

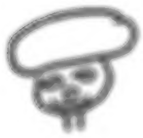
Score	*Description*	*Example*
0	No title given	
1	Simple label or name of the drawn objects *without* any modifier	Hot dog  Canoe  Hat  Lake  Flower 
2	Label or name of the drawn objects *with* descriptive modifier	A foot-long hot dog  An Indian out for a ride  My mom's new hat  Top view of a table  A Texan mosquito  Sky look at a picnic ground and lake 

3 Imaginative title which expresses feelings, reactions, and descriptions over and beyond what can be seen in the picture

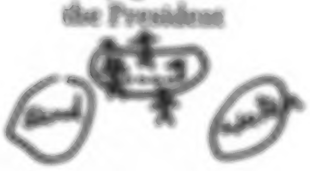
Today is the fair my wiener yum yum



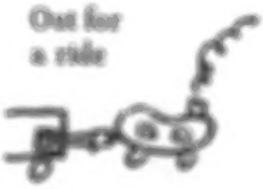
I will cook for you



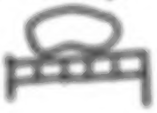
Play golf with the President



Out for a ride



The bread that fell in the red dye



TASK II: FIGURE COMPLETION

Testing Materials

The material required for the Figure Completion task is an answer sheet on which six simple, incomplete figures are printed. A copy of the answer sheet is shown in page 21.

Administration Procedures

The task has so far been administered in a group situation with a time limit of ten minutes. The instructions given are as follows: "By adding lines to the six figures below, sketch some object or design. Try to think of some object or design that no one else in the class will think of. Try to include as many different ideas as you can in your drawing. In other words, don't stop with your first idea for completing the figure; keep building on to it. Make up a title for each of your drawings and write it at the bottom of each block next to the number of the figure." As in the Picture Construction task, the last sentence in the instructions is omitted for the lower grades (up to the third) and the examiners and teachers will put down titles for them.

Scoring Procedures

Four scores, Fluency, Flexibility, Originality, and Elaboration, are derived from test protocols. A score for expressiveness of a title, Title Adequacy, is being developed now.

Fluency

A score for fluency is obtained *simply* by counting the number of responses a subject completed and/or gave a title.

Flexibility

A score for flexibility is obtained by counting the *number of runs* revealed in responses *in terms of* the following three *categories*.

(1) *Life-Nature (denoted by L)*: Any response representing organic life or inorganic nature in any form. This category thus includes plants and their parts, animals and their parts, birds and their parts, fish and their parts, human beings and their parts, as well as natural elements such as sky, sea, cloud, star, mountain, and the like.

(2) *Ornamental-Household(denoted by O)*: Any response representing daily household or decorative items which, however, exclude those belonging to the third category. The distinction between these two categories depends on uses of an item, presence or absence of a more or less self-contained energy source, possibility of spontaneous movement, and other similar considerations. This second category thus includes furnitures, decorative articles, tablewares, clothes, *processed* foods, drugs, sports goods, and the like.

(3) *Scientific-Mechanical (denoted by S)*: Any response representing mechanical constructs or scientific instruments and appliances which imply more or less self-contained energy sources and/or spontaneous movement. This category thus includes various kinds of vehicles, ships, air-going vessels, bridges, roads, buildings, electrical and mechanical instruments and appliances, and the like. Parts of these articles such as coil, condenser, bolt, cog, beam, and picture tube of TV are also included here.

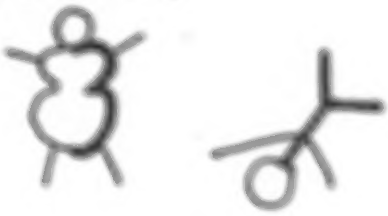
Each response is to be classified into one of these three categories, L, O, or S, and then, Flexibility is obtained quite simply by counting the number of runs in terms of these three symbols. By definition, responses are so ordered as to follow our ordinary reading habit, thus, from the top left figure to the top right, then to the middle left and middle right, and so on. Actual scoring procedures will be clarified by Example P.

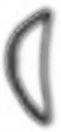
Originality

Originality, as defined here, is the *sum of the weighted scores* given each response *according to the basic principles* (perception patterns) revealed. Table 6 presents the two principles and weights to be given them under each category of Flexibility. These weights are based upon responses from 211 pupils in kindergarten through grade six of an elementary school in Minneapolis.

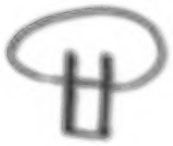
"Symmetry," in Table 6, represents such a pattern of response as to result in a symmetrical completion of the stimulus figure. Any figure which has any axis of symmetry should be classified under this principle. For example:

Symmetry ……………Life-Nature …………Man, woman, boy, girl, or snowman (by definition)

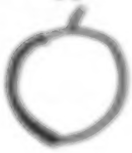




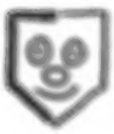
Moon



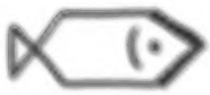
Tree



Apple

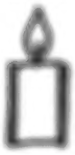


Face

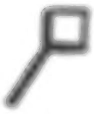


Fish

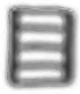
Ornamental-Household .... Candle



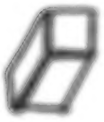
Kite



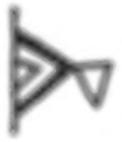
Ladder



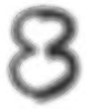
Box



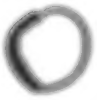
Tent



"8"

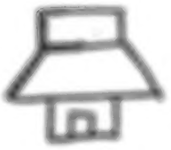


Symmetry .... Ornamental-Household .... Ball

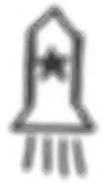


Design, Hat,
Triangle, Cross,
Tic-Tac-Toe,
Bow

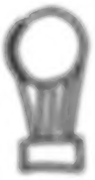
Scientific-Mechanical .... House



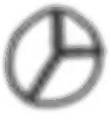
Rocket



Balloon

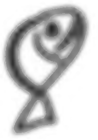


Steering-wheel

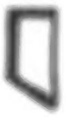


"Asymmetry" represents all those responses in which picture completion was carried out in such a way as not to result in symmetrical figures. For example:

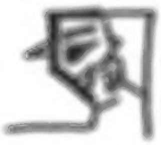
Asymmetry .... Life-Nature .... Fish



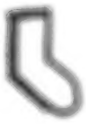
State of Nevada



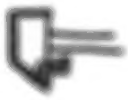
Frankenstein



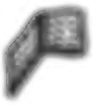
Ornamental- ....Stocking
Household



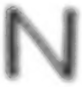
Shoe



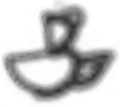
Book



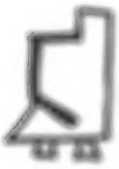
Letter "N"



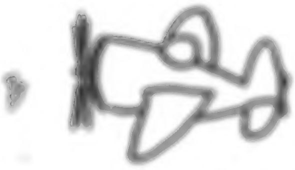
Pot



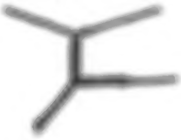
Scientific- ....Old-fashioned stove
Mechanical



Plane



Empty room



Blast off

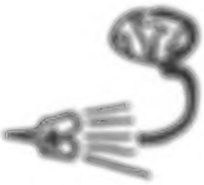


Table 6

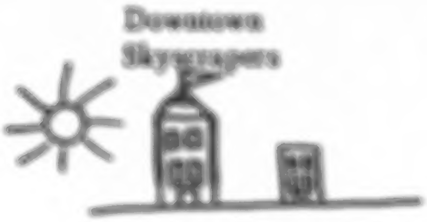
Principles to be Used in Scoring for Originality (Figure Completion) and Weights to Be Given

Categories for Flexibility	Principles for Originality	Scoring Weight[1]	Frequency[2] f	%
Life-Nature (*L*)	Symmetry	1	163	34.8
	Asymmetry	4	19	4.1
			182	38.9
Ornamental-Household (*O*)	Symmetry	1	159	34.0
	Asymmetry	4	12	2.6
			171	36.6
Scientific-Mechanical (*S*)	Symmetry	2	113	24.2
	Asymmetry	4	2	0.4
			115	24.6
		Total	468	100.0

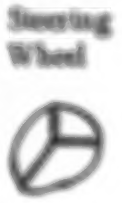
Elaboration

Each response is further considered for its elaborateness and given either two or one points. If a subject describes in his response an object beyond its very minimum essentials (to convey what he has in mind), the response is scored two for elaborateness. For example:

Elaboration score: 2



Elaboration score: 1



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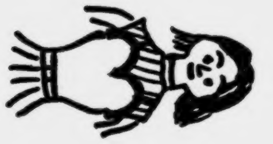
[1] Weights were determined as follows: Weight = 1, if frequency ≥ 30%
Weight = 2, if 30% > frequency ≥ 15%
Weight = 3, if 15% > frequency ≥ 5%
Weight = 4, if frequency < 5%

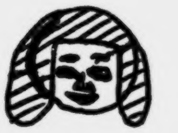
[2] Based upon responses from 211 pupils in kindergarten through grade six of an elementary school.

Elaboration score: 2

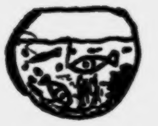
The Pretty Lady



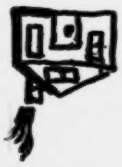
A Little Girl



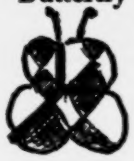
A Fish Bowl



A House

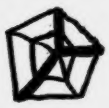


Butterfly

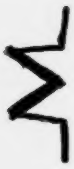


Elaboration score: 1

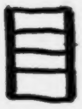
Spider's Web



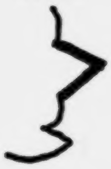
Ears



A Ladder



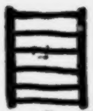
Frosty's Nose



The Moon

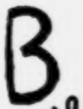
Example P: **(Fluency 6; Flexibility 2; Originality 15; Elaboration 8)**

0-1-1



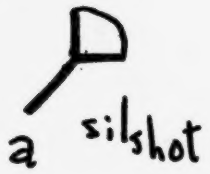
a lattle

0-4-1

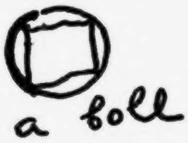


a lettle B

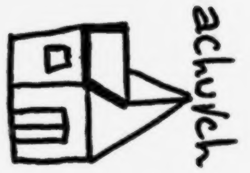
0-1-1



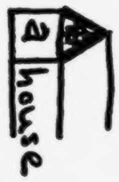
0-1-1



S-4-2

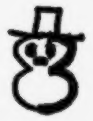
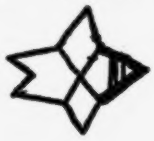
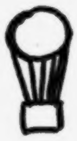
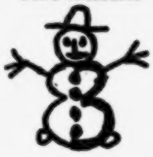
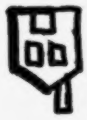
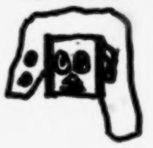


S-4-2



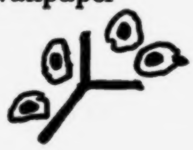
Title Adequacy

This score is now being worked upon and the following provisional scheme is suggested here. In scoring for this dimension, a scorer pays attention primarily to titles given, not to pictures drawn, and to evaluate their expressiveness.

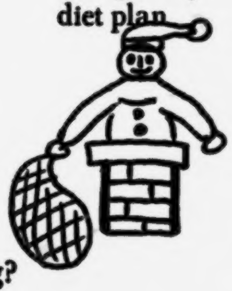
Score	*Description*		*Example*	
0	No title given			
1	Simple label or name of the drawn objects *without* any modifier	Snowman 	Rocket 	Balloon 
2	Label or name of the drawn objects *with* descriptive modifiers	Frosty, the snowman 	Upside down house 	Blockhead on moon 

3 Imaginative title which expresses feelings, reactions, and descriptions over and beyond what can be seen in the picture

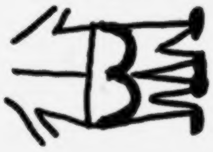
What beautiful wallpaper



I forgot my diet plan



Who gets the next spanking?



TASK III: CIRCLES

Testing Materials

The material required for the Circles task is simply an answer sheet on which 42 small circles (1" diameter) are printed.

Administration Procedures

The task may be administered either individually or in a group situation, although it has, thus far, been administered in group situations. A time limit of ten minutes has been imposed on this task.

The instructions given are as follows: "In ten minutes see how many objects you can make from the circles below. A circle should be the main part of whatever you make. With pencil or crayon add lines to the circles to complete your picture. Your lines can be inside the circle, outside the circle, or both inside and outside the circle. Try to think of things that no one else in the class will think of. Make as many things as you can and put as many ideas as you can in each one. Add names or titles, if it is hard to tell what the object is." In addition, examples are drawn on the blackboard (wheel, frying pan, etc.) and subjects are also told that they can use more than one circle, *if they ask* about the possibility. This is not included in the original instructions, however. Some use two or more circles without asking, while others ask if this is permissible.

Scoring Procedures

Four scores, Fluency, Flexibility, Originality, and Elaboration, are derived from results of the Circles test.

Fluency

A score for fluency is obtained simply by counting the number of responses given, excluding only those responses repeated in an identical form. Because of the difficulty in some instances of deciding whether a response (circle) is completed or not, we would count every response regardless of the degree of perfection (completeness) of the response.

Flexibility

Flexibility score, as defined here, is the *number of runs* revealed in responses *in terms of* the following three *categories.*

(1) *Life-Nature (denoted by L)*: Any response representing organic life or inorganic nature in any form. Thus, this category includes such responses as plants (flowers, trees, grasses, fruits, etc.), animals and their parts (faces, legs, etc.), birds and their parts, fish and their parts, human beings and their parts, in addition to such responses as cloud, sky, rain, snow, sea, lake, mountain, river, and the like.

(2) *Ornamental-Household (denoted by O)*: Any response representing daily household, or decorative items which, however, do not imply any more or less self-containing energy sources and/or possible movement. This category thus includes such responses as ball, coin, container, clothes, frying-pan, decoration, design, drugs, *processed* foods, and the like.

(3) *Scientific-Mechanical (denoted by S)*: Any response representing mechanical constructs or scientific instruments, tools, and other items which imply more or less self-containing energy sources. This category thus includes such responses as bridge, building, ship, automobile, rocket, and man-made satellite, as well as ones such as clock, TV set, radio, radar, barometer (dial instruments), movie projector, telephone, refrigerator, and the like. Parts of these articles are also included here (e.g., washer, condenser, hubcap, turn-signals, and the like).

Each response is to be classified into one of these three categories L, O, or S, and then, Flexibility is obtained quite easily by counting the number of runs in terms of these three symbols. By definition, responses are so ordered as to follow our ordinary reading habit, thus, from the top left corner to right along the first row of circles, then down to the left end of the second row, and so forth. Actual scoring procedures will be clarified by Example Q (page 66).

Originality

Originality, as defined here, is the *sum of the weighted scores* given each response *according to the basic principles* (perception patterns) revealed. Table 7 presents these principles classified under each of the three categories used in deriving Flexibility and weights to be given to each of these. These weights were based upon the frequencies with which each of the principles was used in responses gathered from 588 pupils in grades one through twelve in the Twin Cities area.

Table 7

Principles to be Used in Scoring for Originality (Circles) and Weights to Be Given

Categories for Flexibility	Principles for Originality	Scoring Weight[1]	Frequency[2]	
			f	%
Life-Nature (*L*)	Figure	2	282	18.6
	Field	3	175	11.5
	Structural Parts	4	59	3.9
			516	34.0
Ornamental-Household(*O*)	Figure	1	571	37.6
	Field	3	184	12.1
	Structural Parts	4	23	1.5
			778	51.2
Scientific-Mechanical (*S*)	Figure	4	63	4.2
	Field	3	87	5.7
	Structural Parts	4	75	4.9
			225	14.8
		Total	1519	100.0

In Table 7, "Figure" represents a category (pattern of perception) in which a circle is seen and used as a simple figure in a larger, but unspecified, ground. Some examples are given below:

Figure	Life-Nature	Sun, moon, saturn, earth, fox-hole, flower, apple
	Ornamental-Household	Letter "O," number "O," ball, coin, frying-pan, doughnuts, pie, record, mirror, hoop, basket-hoop, end of a tin-can, door-knob, button
	Scientific-Mechanical	Hub-cap, porthole, bell, electric bulb, lens, globe

---

[1] Weights were determined as follows:
Weight = 1, if frequency $\geq$ 30%
Weight = 2, if 30% $>$ frequency $\geq$ 15%
Weight = 3, if 15% $>$ frequency $\geq$ 5%
Weight = 4, if frequency $<$ 5%

[2] Based upon responses from 588 pupils and students in grades one through twelve.

"Field," on the other hand, represents a category in which a circle is seen and used as a field in which to describe other "figures." Thus we find as examples.

Field	Life-Nature	Human or animal face, eye, half-moon
	Ornamental-Household	Fish-bowl, picture-frame, target, window, umbrella top
	Scientific-Mechanical	Artificial satellite (with inner structure, however; if without internal structure, classify the response as "Scientific-Mechanical: Figure"), clock, compass dial, tire, steering wheel, radar-scope

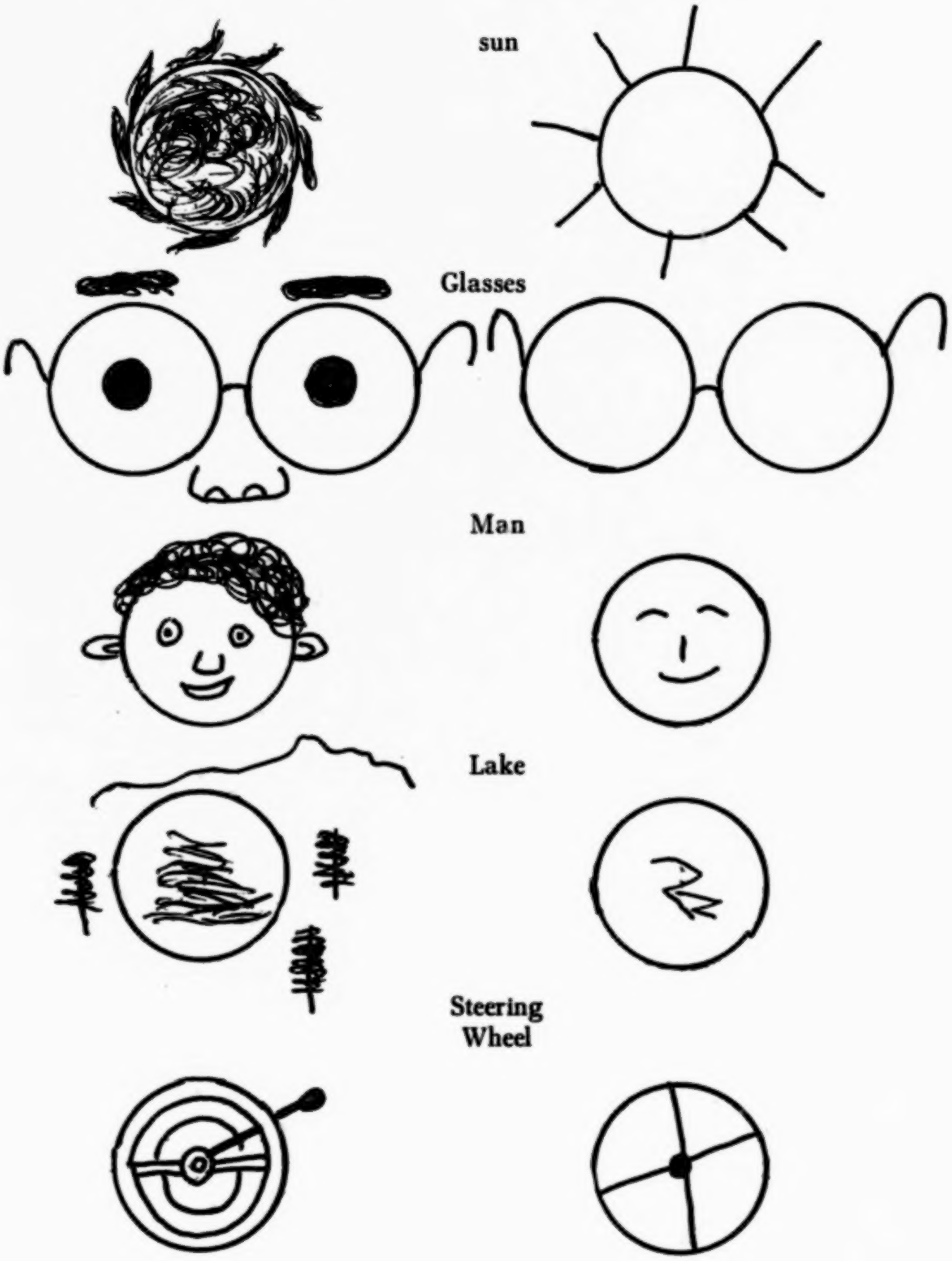
"Structural Parts" represents a third category in which a circle is seen and used as an integral part of a larger structure. Some examples are:

Structural Parts	Life-Nature	Human body, animal body.
	Ornamental-Household	Snowman, smoking pipe, dumb-bell, bracelet
	Scientific-Mechanical	Bicycle, glasses, house, TV set, traffic signals

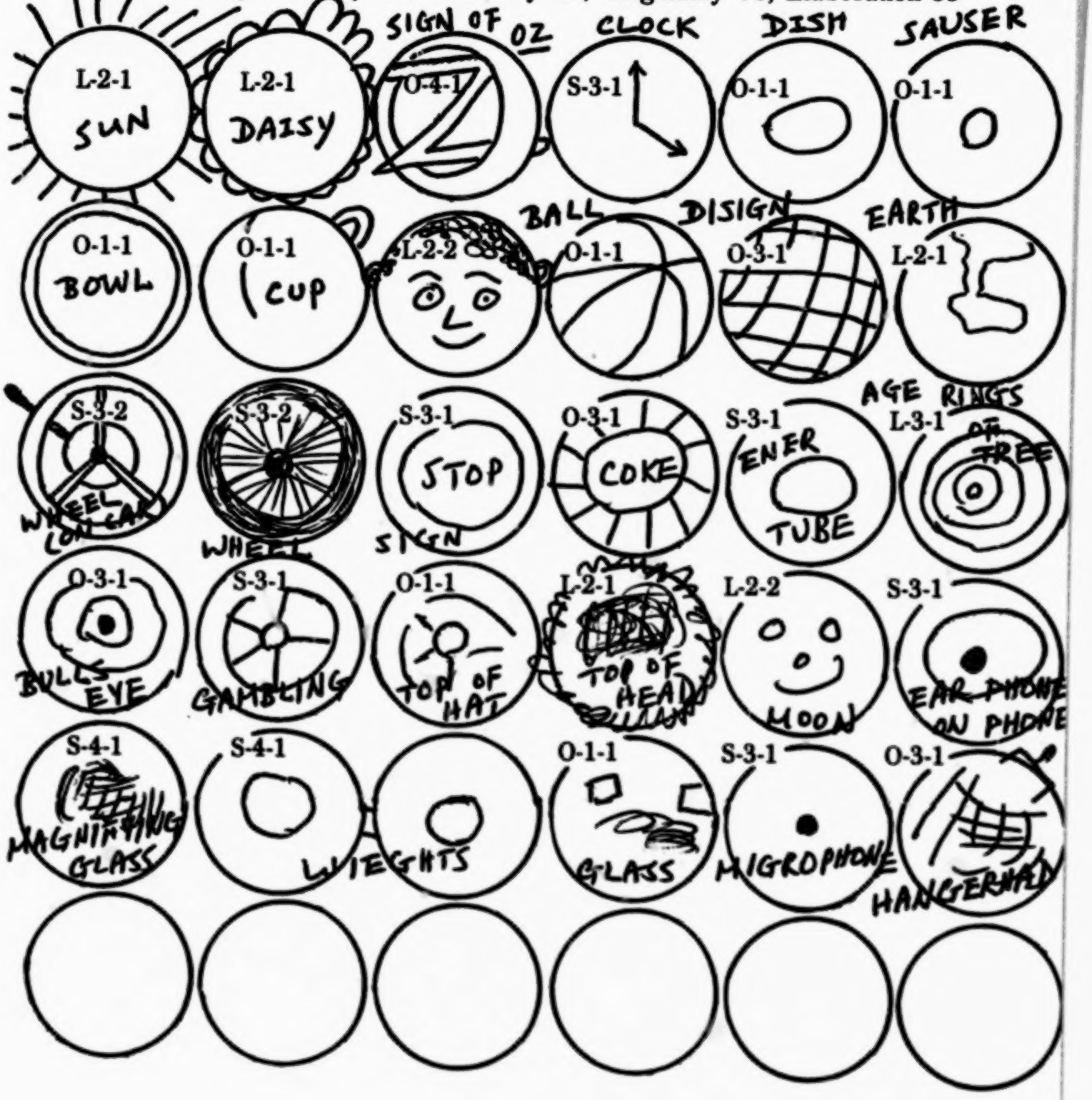
Elaboration

Each response is further considered for its elaborateness and given **either** two or one points. If a subject describes in his response an object beyond its very minimum essentials, the response is scored two for elaborateness; otherwise, one. Thus, for example:

Elaboration score: 2 Elaboration score: 1


sun
Glasses
Man
Lake
Steering Wheel

Example Q: **Fluency 30; Flexibility 19; Originality 70; Elaboration 33**


L-2-1 SUN
L-2-1 DAISY
SIGN OF OZ O-4-1
CLOCK S-3-1
DISH O-1-1
SAUSER O-1-1
O-1-1 BOWL
O-1-1 CUP
L-2-2
BALL O-1-1
DISIGN O-3-1
EARTH L-2-1
S-3-2 WHEEL ON CAR
S-3-2 WHEEL
S-3-1 STOP SIGN
O-3-1 COKE
S-3-1 ENER TUBE
AGE RINGS OF TREE L-3-1
O-3-1 BULLS EYE
S-3-1 GAMBLING
O-1-1 TOP OF HAT
L-2-1 TOP OF HEAD
L-2-2 MOON
S-3-1 EAR PHONE ON PHONE
S-4-1 MAGNIFYING GLASS
S-4-1 WIEGHTS
O-1-1 GLASS
S-3-1 MIGROPHONE
O-3-1 HANGERHAD

QUICK-REFERENCE SUMMARY OF SCORING PROCEDURES

In actual processing processes, we have found it convenient to have summary sheets for some of the tasks discussed. Such summary sheets for five tasks are presented in the following pages. Readers are encouraged to add on to these or to devise their own.

PRODUCT IMPROVEMENT

Principles for Flexibility	Principles for Originality	Scoring Weight
Manipulation (*M*)	No change	0
	Change in Accessories	1
	Change in Color	3
	Change in Orientation	3
	Change in Number	3
Alteration (*A*)	Change in Dimension	2
	Change in Design	2
	Change in Material	2
	Change in Use	3
	Change in Kind	3
Dynamism (*D*)	Simple Animation	1
	Change in Mechanism	2

Note: Unless an operation makes the toy dog more similar to or resemblant of the *real* dog, the operation should not be classified as Animation and unless a response clearly points to an active orientation to change the mechanism, it should not be classified as Mechanism.

UNUSUAL USES

Categories for Flexibility	Principles for Originality	Scoring Weight
Ornamental-Household (*O*)	No change	1
	Change in Materials	1
	Change in Dimension	1
Container-Holder (*C*)	No change	2
	Change in Materials	2
	Change in Dimension	3
Scientific-Mechanical (*S*)	Static	2
	Dynamic	3

PICTURE CONSTRUCTION

	Originality		Elaboration		Activity	
Category	Principles	Score	Description	Score	Description	Score
Life-Nature *(L)*	Simple figure	10	No elaboration beyond the minimum essentials to represent and convey what a subject has in mind	0	Static	0
	Structural part	5			Activity implied	5
	Field	10			Activity shown	10
Ornamental-Household *(O)*	Simple figure	10	Elaboration of picture elements *outside* of the colored sheet	5		
	Structural part	10				
	Field	15	Elaboration of picture elements *inside* of the colored sheet	10		
Scientific-Mechanical *(S)*	Simple figure	5	Elaboration of picture elements *both inside and outside* of the colored sheet	15		
	Structural part	10				
	Field	15				

FIGURE COMPLETION

Principles for Flexibility	Principles for Originality	Scoring Weight
Life-Nature (*L*)	Symmetry	1
	Asymmetry	4
Ornamental-Household (*O*)	Symmetry	1
	Asymmetry	4
Scientific-Mechanical (*S*)	Symmetry	2
	Asymmetry	4

CIRCLES

Categories for Flexibility	Originality		Examples
	Principles	Weight	
Life-Nature (*L*)	Figure	2	Sun, moon, saturn, earth, foxhole, flower, apple
	Field	3	Human face, animal face, eye, half-moon
	Structural Parts	4	Human body, animal body, sea shell, molecule
Ornamental-Household (*O*)	Figure	1	Letter "O", number "0", ball, coin, frying pan, doughnuts, pie, record, mirror, hoop, basket-hoop, end of a tin can, ring, door-knob, button
	Field	3	Fish-bowl, picture frame, target, window, umbrella, top
	Structural Parts	4	Snowman, smoking pipe, dumb-bell, bracelet, dice, horn of harvest
Scientific-Mechanical (*S*)	Figure	4	Hub-cap, porthole, bell, electric bulb, lens, globe, a satellite (no inner structure)
	Field	3	Artificial satellite (with internal mechanism), clock, compass dial, tire, steering wheel, radar scope
	Structural Parts	4	Bicycle, glasses, house, TV set, trumpet*, traffic signals

*By definition, musical instruments are classified as *S*. Whether they belong to Figure, Field, or Structural Parts should be determined individually.

Note: By definition, the Fluency score is based upon the number of circles used in a subject's responses and not upon the number of responses, i.e., a pair of glasses using two circles would be counted as 2.

TECHNICAL APPENDICES

Relationships of Proposed Scheme with Original Scheme

To establish continuity in our efforts to produce a satisfactory scoring method, it seems highly desirable that various schemes are correlated with each other. This section reports two kinds of data interrelating the proposed scoring method with the original method described in

Torrance, E. P., Yamamoto, K., Schenitzki, D., et al. *Assessing the creative thinking abilities of children.* Minneapolis: Bureau of Educational Research, University of Minnesota, 1960.

Torrance, E. P. *Guiding creative talent.* Englewood Cliffs, N. J.: Prentice-Hall, 1962.

First, for every *new* score not existent before, correlation coefficients were computed between the new score and the older scores. Second, means of the new scores were computed for students who were divided into High Creative (top 25 per cent), Middle Creative (middle 50 per cent), and Low Creative (bottom 25 per cent) groups on the basis of a total creativity score derived by the original method. The total score was based upon Fluency and Adequacy from the Ask-and-Guess Test; Fluency, Flexibility, Cleverness, Inventive-level, and Constructiveness from the Test of Imagination.

Ask-and-Guess Test

Since the Flexibility score for the Ask-and-Guess Test has not been existent before, correlation coefficients were computed between this score and other scores derived earlier from 78 test protocols obtained from the same number of tenth grade students in a Minneapolis high school. Table 8 presents the results and it is seen that all the correlations are high and significant.

Table 8

Correlation Coefficients Between New Ask-and-Guess Flexibility Score and Other Measures of Creative Thinking Based on 78 Tenth-Grade Subjects' Protocols

Test	Scores	Correlation Coefficient with New Ask-and-Guess Flexibility
Ask-and-Guess	Fluency (old)	.79 ***
	Adequacy (old)	.72 ***
	Total (Fluency and Adequacy: old)	.78 ***
Ask-and-Guess and Test of Imagination	Total Creativity (Fluency and Adequacy from Ask-and-Guess; Fluency, Flexibility,[1] Cleverness, Inventive-level and Constructiveness from Test of Imagination)	.63 ***

*** Significant at less than .1 per cent level.

When Total Creativity score described in Table 8 was used to divide the 78 tenth grade subjects into three groups, High Creative (top 25 per cent), Middle Creative (middle 50 per cent), and Low Creative (bottom 25 per cent), group means for various measures of creative thinking shown in Table 9 were obtained. It is seen that the new Flexibility score is differentiating these three groups equally as well as are older measures of creative thinking.

[1] Old Flexibility score and not the ones proposed in this paper.

Table 9

Means and Standard Deviations of Various Measures of Creative Thinking for High Creative, Middle Creative, and Low Creative Groups of Tenth Grade Students

		Total Group			High Creat.		Mid. Creat.		Low Creat.	
Test	Scores	N	Mean	Std. Dev.	N	Mean	N	Mean	N	Mean
Ask-and-Guess	Fluency (old)	78	34.23	9.80	21	44.48	36	33.83	21	24.67
	Adequacy (old)	78	30.68	8.02	21	37.90	36	31.33	21	22.33
	Total (Fluency Adequacy: old)	78	64.91	17.39	21	82.38	36	65.17	21	47.00
	Flexibility (new)	78	22.88	6.77	21	28.19	36	23.03	21	17.33
Ask-and-Guess and Test of Imagination	Total Creativity[1] (old)	78	249.10	69.71	21	338.81	36	239.67	21	175.57

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[1] Cf. Table 8 for the component scores.

Test of Imagination

Product Improvement (Toy Dog). Since Flexibility, Originality, and Elaboration scores, as defined here, are all new measures, correlation coefficients were computed between these and other measures of creative thinking derived earlier from test protocols of 78 subjects in the tenth grade of a Minneapolis high school. Table 10 presents the results. Note, especially, the high correlation between our Originality score and Total Creativity score based upon various old measures. All the correlations are highly significant.

Table 10

Correlations Between New Flexibility, Originality, and Elaboration Scores for the Product Improvement Task and Other Measures of Creative Thinking Based on 78 Tenth Grade Subjects' Protocols

Test	Old Scores Derived	Correlation with New Scores		
		Flex.	Orig.	Elab.
Test of Imagination	Flexibility (old)	.55***		
	Inventivelevel		.63***	
Ask-and-Guess and Test of Imagination	Total Creativity (Fluency and Adequacy from Ask-and-Guess; Fluency, Flexibility, Cleverness, Inventivelevel and Constructiveness from Test of Imagination)	.62***	.85***	.81***

*** Significant at less than .1 per cent level.

When Total Creativity score was used in dividing the 78 tenth grade subjects into three groups, High Creative (top 25 per cent), Middle Creative (middle 50 per cent), and Low Creative (bottom 25 per cent), group means for various measures, old and new, of creative thinking shown in Table 11 were obtained. From this, it is seen that the new measures are differentiating these three groups equally as well as are the older measures.

Table 11

Means and Standard Deviations of Various Measures of Creative Thinking for High Creative, Middle Creative, and Low Creative Groups of Tenth Grade Students

Test	Scores	Total Group			High Creat.		Mid. Creat.		Low Creat.	
		N	Mean	Std. Dev.	N	Mean	N	Mean	N	Mean
Test of Imagination	Flexibility (old)	78	6.18	1.55	21	7.14	36	6.00	21	5.52
	Inventivelevel (old)	78	20.47	10.73	21	32.29	36	18.42	21	12.19
Ask-and-guess and Test of Imagination	Total Creativity[1] (old)	78	249.10	69.71	21	338.81	36	239.67	21	175.57
Product Improvement Task	Flexibility (new)	78	7.09	2.85	21	9.43	36	6.92	21	5.05
	Originality (new)	78	20.92	7.69	21	27.86	36	20.94	21	14.71
	Elaboration (new)	78	16.90	6.36	21	22.71	36	17.22	21	10.52

[1] See Table 8 for the component scores.

Unusual Uses (Toy Dog). Since Flexibility, Originality, and Elaboration scores, as defined here, are all new measures, correlation coefficients were computed between these and other measures of creative thinking derived earlier from test protocols of 78 subjects in the tenth grade of a Minneapolis High school. Table 12 presents the results. Note, especially, the high correlations between Originality and Inventivelevel and between Originality and Total Creativity. All of the correlations are highly significant.

Table 12

Correlations Between New Flexibility, Originality, and Elaboration Scores for the Unusual Uses Task and Other Measures of Creative Thinking Based on 78 Tenth Grade Subjects' Protocols.

Test	Old Scores Derived	Correlation with New Scores		
		Flex.	Orig.	Elab.
Test of Imagination	Flexibility	.47***		
	Inventivelevel		.86***	
Ask-and-Guess and Test of Imagination	Total Creativity (Fluency and Adequacy from Ask-and-Guess; Fluency, Flexibility, Cleverness, Inventive-level and Constructiveness from Test of Imagination)	.55***	.75***	.82***

*** Significant at less than .1 per cent level.

When Total Creativity score was used in dividing up the 78 tenth grade subjects into three groups, High Creative (top 25 per cent), Middle Creative (middle 50 per cent), and Low Creative (bottom 25 per cent), group means for various measures, old and new, of creative thinking shown in Table 13 were obtained. It is seen from this that new measures are differentiating these three groups equally as well as are older measures.

Table 13

Means and Standard Deviations of Various Measures of Creative Thinking for High Creative, Middle Creative, and Low Creative Groups of Tenth Grade Students

Test	Scores	N	Total Group		High Creat.		Mid. Creat.		Low Creat.	
			Mean	Std. Dev.	N	Mean	N	Mean	N	Mean
Test of Imagination	Flexibility (old)	78	5.29	1.87	21	6.62	36	5.33	21	3.90
	Inventivelevel (old)	78	17.60	8.35	21	25.33	36	16.36	21	12.00
Ask-and-Guess and Test of Imagination	Total Creativity[1] (old)	78	249.10	69.71	21	338.81	36	239.67	21	175.57
Unusual Uses	Flexibility (new)	78	3.68	2.25	21	5.19	36	3.61	21	2.29
	Originality (new)	78	9.62	4.70	21	13.95	36	9.28	21	5.86
	Elaboration (new)	78	10.96	5.14	21	15.29	36	10.78	21	6.95

[1] See Table 12 for the component scores

Inter-scorer Reliabilities of Proposed Scoring Scheme

Three sets of interscorer reliabilities are presented in this section. The first set (Table 14) was obtained when the proposed scoring scheme was made and tried out for the first time. The writer was one of the two scorers and the other was an undergraduate student having had some experience in scoring of tests of creative thinking. No consultation whatsoever to iron out personal differences in interpretation was made and the scoring was carried out independently and depending solely upon the instructions given in the preceding pages of this paper.

The second set (Table 15) was based upon 65 fifth-grade protocols scored by two experienced scorers including the writer. Again, no consultation was made in scoring these protocols obtained from a suburban Minneapolis school.

Finally, the third set (Table 16) represented interscorer reliabilities among four scorers on 76 protocols (24 fourth-grade, 25 fifth-grade, 27 sixth-grade) from a northeastern Ohio elementary school. The writer was one of the scorers and the remaining three were his research assistants with no previous experience.

These data show that a high degree of agreement can be easily attained among scorers on the basis of the scoring procedures elucidated in this manual.

Table 14

Interscorer Reliabilities for Two Scorers (Minneapolis Data)

			Population		
Test	Task (Subtest)	Grade	N	Score	r
Ask-and-Guess	Total (Ask, Causes, & Consequences)	10	78	Flexibility	$.91^{***}$
Imagination	Product Improvement (Toy Dog)	10	78	Flexibility	$.76^{***}$
				Originality	$.95^{***}$
				Elaboration	$.94^{***}$
	Unusual Uses (Toy Dog)	10	78	Flexibility	$.80^{***}$
				Originality	$.96^{***}$
				Elaboration	$.77^{***}$
Nonverbal	Picture Consturction	5	50	Originality	$.98^{***}$
				Elaboration	$.95^{***}$
				Activity	$.88^{***}$
	Figure Completion	5	34	Fluency	$.99^{***}$
				Flexibility	$.92^{***}$
				Originality	$.78^{***}$
				Elaboration	$.96^{***}$
	Circles	10	59	Fluency	$.98^{***}$
				Flexibility	$.92^{***}$
				Originality	$.94^{***}$
				Elaboration	$.97^{***}$

$^{***}\ p < .001$

Table 15

Interscorer Reliabilities for Two Scorers Based on 65 Fifth-Grade Protocols (Surburban Minneapolis Data)

Test	Task (Subtest)	Score	r
Ask-and-Guess	Total (Ask, Causes, & Consequences)	Fluency	1.00***
		Adequacy	.96***
		Flexibility	.97***
		Subtotal	.99***
Imagination	Product Improvement (Toy Dog)	Fluency	1.00***
		Flexibility	.87***
		Originality	.98***
		Elaboration	.99***
		Subtotal	.87***
	Unusual Uses (Toy Dog)	Fluency	1.00***
		Flexibility	.84***
		Originality	.92***
		Elaboration	.98***
		Subtotal	.91***
	Unusual Uses (Tin Can)[1]	Fluency	1.00***
		Flexibility	.87***
		Originality	.98***
		Elaboration	.99***
		Subtotal	.94***
Nonverbal	Circles	Fluency	1.00***
		Flexibility	.91***
		Originality	.98***
		Elaboration	.98***
		Subtotal	.99***
	Total of Product Improvement, Dog, Uses, Can Uses, and Circles	Fluency	1.00***
		Flexibility	.98***
		Originality	.99***
		Elaboration	.99***
Grand Total			.99***

[1] This is a variation of the Unusual Uses task in which a tin can is the object in place of a toy dog. In this case, the scoring scheme for the Toy Dog Uses task was applied to the responses on the Can Uses task with full awareness of the fact that separate scoring weights are to be compiled for the latter task.

*** $p < .001$

Table 16

Interscorer Reliabilities for Total Creativity Score[1] Obtained by Four Scorers on 76 Protocols of Upper Elementary Grades (Northeastern Ohio Data)

	Scorer			
Scorer	A	B	C	D
A	--	.98***	.98***	.98***
B		--	.99***	.98***
C			--	.97***
D				--

Test-Retest Reliabilities of Proposed Scoring Scheme

Two sets of data are available for test-retest reliabilities of the creative thinking tasks when scored by the proposed method. The first set was obtained from a class of 22 college seniors tested with an interval of three months and the results are tabulated in Table 17.

The second set was obtained from 70 fourth-, fifth-, and sixth-grade children tested with an interval of 8 weeks and the results are presented in Table 18.

From both of these tables, it is observed that the creativity measures tend to be stable over a short interval, even though its long-range stability is unknown. Reliabilities for each subscores vary but the total scores would seem to be reliable enough for most research purposes.

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[1] In this case, the Total Creativity score included the following: Fluency, Adequacy, and Flexibility from the three parts of the Ask-and Guess Test; and Fluency, Flexibility, Originality, and Elaboration for Product Improvement, Unusual Uses (Toy Dog), and Circles.

*** $p<.001$

Table 17

Test-Retest Reliabilities for Various Subscores of Creative Thinking Derived from Test of Imagination and Ask-and-Guess Test Administered Twice to a Class of 22 College of Education Seniors with an Interval of Three Months[1]

Test	Part (Task)	Score Derived	Test-Retest r
Test of Imagination	I (Toy Dog: Improvement	Fluency	.69**
		Flexibility	.64**
		Originality	.61**
		Elaboration	.75**
		Subtotal	.73**
	II (Toy Dog: Unusual Uses)	Fluency	.85**
		Flexibility	.69**
		Originality	.77**
		Elaboration	.81**
		Subtotal	.83**
	III (Tin Cans: Unusual Uses)	Fluency	.75**
		Flexibility	.60**
		Originality	.64**
		Elaboration	.57**
		Subtotal	.68**
	IV (Circles)	Fluency	.76**
		Flexibility	.63**
		Originality	.79**
		Elaboration	.67**
		Subtotal	.75**
	I-IV Totals	Fluency	.85**
		Flexibility	.76**
		Originality	.83**
		Elaboration	.85**
Ask-and-Guess Test	I-III Total (I: Ask) (II: Guess Causes) (III: Guess Consequence)	Fluency	.83**
		Flexibility	.56**
		Adequacy	.78**
		Subtotal	.85**
Test of Imagination and Ask-and-Guess Test		Grand Total (Total Creativity Score)	.87**

** Significant at the .01 level or less

[1] From Yamamoto (1962)

Table 18

Test-Retest Reliabilities for Various Subscores of Creative Thinking Derived from Test of Imagination and Ask-and-Guess Test Administered Twice to 70 fourth-, Fifth-, and Sixth-Graders with an Interval of 8 Weeks

Test	Part (Task)	Score Derived	Test-Retest r
Ask-and-Guess Test	I (Ask)	Fluency	.78**
		Adequacy	.77**
		Flexibility	.72**
		Subtotal	.75**
	II (Guess Causes)	Fluency	.59**
		Adequacy	.68**
		Flexibility	.34**
		Subtotal	.53**
	III (Guess Consequences)	Fluency	.60**
		Adequacy	.46**
		Flexibility	.43**
		Subtotal	.53**
	I-III Total	Fluency	.74**
		Adequacy	.76**
		Flexibility	.66**
		Total	.52**
Test of Imagination	IV (Toy Dog: Improvement)	Fluency	.70**
		Flexibility	.47**
		Originality	.60**
		Elaboration	.71**
		Subtotal	.66**
	V (Toy Dog: Unusual Uses)	Fluency	.42**
		Flexibility	.28*
		Originality	.46**
		Elaboration	.53**
		Subtotal	.49**

table 18 continued.................

Test	Part (Task)	Score Derived	Test-Retest r
	VI (Circles)	Fluency	.63**
		Flexibility	.68**
		Originality	.58**
		Elaboration	.51**
		Subtotal	.61**
Test of Imagination	IV-VI Total	Fluency	.57**
		Flexibility	.62**
		Originality	.64**
		Elaboration	.67**
		Total	.66**
Both Tests	I-VI Total	Grand Total	.79**

** Significant at the .01 level or less

* Significant at the .05 level

Intercorrelations among Scores on Proposed Scheme

Inter-score correlations were computed on three sets of data. The first set (Table 19) was obtained when the scoring scheme was first tried out with fifth- and tenth-graders in Minneapolis. From Table 19 it is observed that, except for the Picture Construction task, the derived scores are correlated with each other to a significant degree, although the overlapping in variance seldom exceed 60 per cent.

It is also seen from this table that many scores are rather highly correlated with Fluency. Such has always been the case for many of our creativity measures, and especially for the Circles task (see, e.g., Bowers, 1960.) It is not difficult to see the reason why Elaboration is so highly correlated with Fluency because, after all, not too many elaborate responses are found and, therefore, the former score does not differ too much from the latter score.

A similar picture appeared in the second set of data based upon 64 fifth-grade protocols from a suburban Minneapolis school. The results are presented in Table 20.

Still another set of data was obtained from 76 protocols from upper elementary grades in a northeastern Ohio school. Table 21 presents the results.

Naturally, these extremely high correlations among the derived creativity scores tend to make the proposed scheme suspect. It is obvious that these "separate" measures are measuring some common aspect of subjects' responses and they are, in this sense, consistent. There is, however, a strong suspicion that these scores are redundant in the sense that they do not measure anything but that aspect of behavior best represented by fluency of ideas. In other words, most of our measures are highly dependent upon the quantity of responses rather than upon the quality of responses.

In this regard, it might very seriously be considered that we should construct a power test of creative thinking instead of the traditional speed test where the instruction puts an emphasis on the number of simple ideas to be yielded within a specified time limit. Quite possibly, we are missing some important aspects of creative activities by asking our subjects to come up with "as many ideas" as they can, instead of asking them to respond with "as good ideas" as they can. From this viewpoint, tests such as the Picture Construction would seem to have a better possibility in observing how a subject hits upon an idea and then follow it up to produce an elaborate, communicable, and/or usable solution to a question by holding the number of responses constant.

Table 19

Scale Inter-correlations (Minneapolis Data)

Task	Grade	N	Score	Score[1]			
				Fx	O	E	Ac
Product Improvement (Dog)	10	78	Fx		.65***	.66***	
			O			.80***	
Unusual Uses (Dog)	10	78	Fx		.69***	.64***	
			O			.83***	
Picture Consturction	5	50	O			.16	-.19
			E				.00
Figure Completion	5	34	Fl	.76***	.76***	.82***	
			Fx		.69***	.79***	
			O			.70***	
Circles	10	59	Fl	.78***	.89***	.91***	
			Fx		.71***	.58***	
						.83***	

[1] Symbols stand for the following scores:
Fl - Fluency
Fx - Flexibility
O - Originality
E - Elaboration
Ac - Activity

*** $p < .001$

Table 20

Scale Intercorrelations Based Upon 64 Fifth-Grade Protocols of Test of Imagination[1] (Suburban Minneapolis Data)

Score	Score			
	Fl. Total	Fx. Total	O. Total	E. Total
Fl. Total	--	.77***	.96***	.98***
Fx. Total		--	.74***	.74***
O. Total			--	.95***
E. Total				--
Grand Total	.98***	.79***	.96***	.98***

Table 21

Scale Intercorrelations Based Upon 76 Upper-Elementary Protocols (Northeastern Ohio Data)

		Score				
Test	Score	Fl. Total	Ad. Total	Fx. Total	O. Total	E. Total
Ask-and-Guess	Fl. Total	---	.94***	.89***		
	Ad. Total		---	.81***		
Imagination[2]	Fl. Total	---		.82***	.95***	.94***
	Fx. Total			---	.82***	.82***
	O. Total				---	.93***

---

[1] In this case, the Test of Imagination included Product Improvement (Dog), Unusual Uses (Dog), Unusual Uses (Tin Can), and Circles.

[2] The Test of Imagination in this case consisted of Product Improvement (Dog), Unusual Uses (Dog), and Circles.

*** $p < .001$

Validation Data on Proposed Scheme

In this section, results of two validation trials, both against teacher nominations, are presented. The first study dealt with 569 fifth-grade pupils in a suburban Minneapolis public school system. Nominations from 19 teachers on five criteria (Fluency, Flexibility, Originality, Elaboration, and a combined criterion for Total Creativity) were used in dividing the pupils into two groups, Nominated and Non-nominated, and their scores on the Tests of Creative Thinking (Ask-and-Guess and Imagination) were compared. The results are presented in Table 22.

Table 22

Validation of Tests of Creative Thinking Against Teacher Nominations by Comparison of Nominated Group with Non-Nominated Group Among Fifth-Grade Subjects in 19 Classes [1]

	Nominated		Non-Nominated		MS between	MSE	F
	N	Mean	N	Mean			
Fluency	56	67.38	513	56.32	6170.710	386.996	15.95***
Flexibility	50	35.36	487	31.35	728.734	131.799	5.53*
Originality	82	73.51	487	66.49	3458.026	593.623	5.83*
Elaboration	50	53.54	461	49.83	619.872	192.111	3.23#
Total Creat.	129	243.89	440	210.85	108935.241	5200.769	20.95***

The second study dealt with 825 fifth-grade pupils in a suburban Akron public school system. Nominations from 30 teachers on six criteria (Fluency, Adequacy, Flexibility, Originality, Elaboration, and a combined criterion for Total Creativity) were used in dividing the pupils into three groups, Nominated-as-High, Nominated-as-Low, and Non-nominated, and their scores on the Tests of Creative Thinking (Ask-and-Guess and Imagination) were compared. For Total Creativity, those pupils who were nominated on *at least two* of the five individual criteria (Fluency, Adequacy, Flexibility, Originality, and Elaboration) as either high or low were classified as belonging to the Nominated groups.

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[1] From Yamamoto (1962): Suburban Minneapolis Data.

#$p<.10$
*$p<.05$
**$p<.01$
***$p<.001$

Table 23

Validation of Test of Creative Thinking Against Teacher Nominations by Comparison Among Nominated-as-High Group, Nominated-as-Low Group, and Non-Nominated Group Among Fifth-Grade Subjects in 30 Classes (Northeastern Ohio Data)

Score	Nominated-as-High		Non-Nominated		Nominated-as-Low		MS among	MSE	F
	N	Mean	N	Mean	N	Mean			
Fluency	88	55.53	651	48.17	86	43.35	3353.323	332.684	10.08***
Adequacy	88	21.61	657	17.89	80	16.51	658.036	60.502	10.88***
Flexibility	86	32.01	654	27.10	85	25.00	1555.347	118.675	13.11***
Originality	84	60.64	656	54.76	85	48.85	2939.400	307.244	9.57***
Elaboration	84	39.42	661	33.96	80	30.26	1788.808	118.468	15.10***
Total Creat.	118	208.50	596	182.38	111	163.34	59798.854	2745.285	21.78***

***$p < .001$

Some Norm Information on Proposed Scheme

There is no carefully collected norm information available and most research workers have been forced to depend upon their respective intra-group criteria, based on the performance of local subjects, without any inter-group criterion. Accordingly, the results presented here are at best merely suggestive and should not be construed as standardization data.

Table 24

Mean Scores on Originality

Subjects: University of Minnesota High School students
Tests Used: Product Improvement (Toy Dog)
Unusual Uses (Toy Dog)
Circles

Test Date: Fall 1959

Mean Scores:

Grade	Sex	N	Product Improvement	Unusual Uses	Circles
7	M	33	15.18	7.36	32.82
	F	25	15.64	8.16	37.48
8	M	40	17.95	9.65	39.62
	F	36	14.39	7.56	30.50
9	M	38	20.39	12.24	42.32
	F	38	21.82	13.89	49.89
10	M	39	20.15	10.05	50.64
	F	39	18.28	8.79	39.05
11	M	37	20.16	11.68	46.86
	F	35	24.00	13.77	57.17
12	M	36	18.61	10.58	51.92
	F	33	21.24	14.12	53.03

Table 25

Mean Total Scores on Tests of Creative Thinking

Subjects: 569 fifth graders in 19 classes in six elementary schools of the Edina-Morningside School System of Minnesota

Test Date: September-October, 1961

Tests Used and Scores Derived:

Test	Part	Score				
		Fluency	Flex.	Orig.	Elab.	Adequacy
Test of Imagination (Form DX)	1. Product Improvem.(Dog)	X	X	X	X	
	2. Unusual Uses (Dog)	X	X	X	X	
	3. Unusual Uses (Tin Cans)	X	X	X	X	
	4. Circles	X	X	X	X	
Ask-and-Guess Test	1. Ask	X	X			X
	2. Guess Causes	X	X			X
	3. Guess Consequences	X	X			X
Total		X	X	X	X	X

Means and Standard Deviations:

Score	N	Mean	Sd.
Fluency Total	569	57.41	19.91
Flexibility Total	569	32.31	11.15
Originality Total	569	67.50	24.45
Elaboration Total	569	49.65	14.16
Adequacy Total	569	14.45	6.88
Total Creativity	569	221.33	63.70

Table 26

Mean Scores on Tests of Creative Thinking

Subjects: 535 fifth graders in 18 classes in six elementary schools of the Edina-Morningside School System of Minnesota

Test Date: September-October, 1961

		Score				
Test	Part	Fluency	Flex.	Orig.	Elab.	Adequacy
Test of Imagination (Form DX)	1. Product Improvem.(Dog)	9.64	4.30	17.98	11.16	
	2. Unusual Uses (Dog)	6.12	2.81	8.91	6.71	
	3. Unusual Uses (Tin Cans)	9.45	4.52	16.68	9.95	
	4. Circles	16.01	9.27	25.43	19.96	
Ask-and-Guess Test	1. Ask	17.10	12.21			14.85
	2. Guess Causes					
	3. Guess Consequences					

Table 27

Distribution on Mean Total Scores on Tests of Creative Thinking[1]

Subjects: Fifth-grade children from five schools in Oakland, California, Public School System

Tests Used: Ask-and-Guess Test
Product Improvement (Dog)
Unusual Uses (Dog)
Consequences
Circles
Picture Construction
Picture Completion

Test Date: Spring 1963

	Socio-economic Level					
	High (N =55)			Low (N =62)		
Score	Q_3	Q_2	Q_1	Q_3	Q_2	Q_1
Fluency Total	63.3	51.4	39.8	63.6	51.4	40.8
Flexibility Total	33.7	29.8	24.4	32.8	27.5	22.2
Originality Total	75.3	57.5	46.8	69.5	60.0	43.3
Elaboration Total	46.2	36.6	27.3	41.7	34.9	26.5
Adequacy Total	24.4	18.1	12.6	27.1	21.3	14.1
Total	241.0	190.0	161.4	227.5	192.0	153.8

Studies in Which Proposed Scheme Was Employed

Many studies have been made with the Minnesota Tests of Creative Thinking but, unfortunately, not many investigators are explicit about the particular scoring scheme used in their studies. As a result, it is extremely difficult to give any comprehensive list of research work employing the proposed scoring scheme which is, after all, only one of the several experimental methods developed at Minnesota. To the writer's knowledge, the following studies definitely used the scoring scheme proposed in this manual and, hence, they are listed for reader's reference.

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[1] Courtesy of Mrs. Grace Ross, Assistant in Research, Oakland Public Schools

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SCORING MANUAL FOR EVALUATING IMAGINATIVE STORIES

FOREWORD

This is the first revised edition of a scoring guide for evaluating the "creativity" of imaginative stories written by children in grades three through six. Although we are far from satisfied with it, we have reasonable confidence in it as a device for assessing creative growth as expressed through the writing of imaginative stories. A separate report will describe the experiments which have been conducted, using imaginative stories as criteria of creative growth. The suggested titles used in this work all involve some divergent behavior or characteristic of an animal or person. We believe that through this medium children reveal many important feelings and ideas concerning divergency. Additional stories have been collected in a variety of cultures and sub-cultures and are being analyzed for differences in attitudes concerning divergency. Reports concerning this work will also be described in forthcoming reports.

The authors would like to acknowledge the assistance of George Shears, Mark Sigmund, and Kevser Arsan for their assistance in scoring the stories.

E. Paul Torrance, Director
Bureau of Educational Research
University of Minnesota

January 1961

INTRODUCTION

It is always difficult to evaluate written products without subjective biases or halo-effects. It is especially difficult to judge writings in terms of ideas, concepts, and qualities of originality, instead of literary values, grammatical correctness, and refinement. Fortunately or unfortunately, what is required in our creative writing projects is this difficult task of evaluating our subjects' writings in terms of their creative achievement. The task is new and challenging. We must, therefore, duly expect many mistakes and blunders, ups and downs, in our process of making something meaningful out of this undertaking. This manual marks the first, if awkward, step towards the desired goal.

In the very process of compiling and revising this manual, we have been constantly reminded of many defects or shortcomings in our scoring scheme.

For one thing, we found that we had increased semantic difficulties by setting up the multi-criterion scoring scheme. Before, it sufficed to define only six terms: organization, sensitivity, originality, imagination, psychological insight, and richness. But now, with five subdivisions under each category, we are confronted with a difficult task of defining these thirty terms without, if ever possible, any overlapping. In the scoring process, we have strongly felt an urgent need for some item-analytic study to sift out a minimum number of categories which are necessary but not redundant in identifying the highly creative writers and thinkers.

For another, we have been confronted with the same old problem of social versus psychological criteria of creativity. So long as we hope to apply a uniform scoring scheme to all the population including both adults and children, we must somehow find our place between these two, not necessarily compatible, criteria of creative thinking ability. Sometimes it seems almost impossible to make a compromise.

Many questions will undoubtedly be raised against the particular system of categorization and classification used herein and many examples given will, again undoubtedly, be replaced by better and more adequate ones. The objective of the manual, however, will remain the same in that it tries to minimize subjectivity in evaluating creative writing productions and to maximize objectivity and, hence, reliability.

More specifically, we tried to supply adequate examples and to give operational, even if somewhat arbitrary, definition of our scheme. We know very well that this again is a tentative solution but we hope that it serves our present purposes.

Testing Material

Thus far, two different forms, Form A and Form B, have been used in the project. On each of these forms, ten topics are given, and subjects are asked to choose one of them and to write the most interesting and exciting story they can think of about that topic. Subjects are urged not to be preoccupied with their handwriting, spelling, and the like; instead, they are asked to put as many good ideas as they can think of into their stories. Time limits are fifteen minutes for both Form A and Form B.

The instructions on the booklet are as follows:

In the next fifteen minutes, we would like for you to write the most interesting and exciting story you can think of about one of the topics listed below. Try to write legibly but do not worry too much about your writing, spelling, and the like. Instead, try to put into your story as many good ideas as you can. Choose any one of the following topics or make up a similar one of your own:

The following titles were suggested in Form A;

1. The dog that doesn't bark.
2. The man who cries.
3. The woman who can but won't talk.
4. The cat that doesn't scratch.
5. Miss Jones stopped teaching.
6. The doctor who became a carpenter.
7. The rooster that doesn't crow.
8. The horse that won't run.
9. The duck that doesn't quack.
10. The lion that doesn't roar.

The following titles were suggested in Form B;

1. The teacher who doesn't talk.
2. The hen that crows.
3. The dog that won't fight.
4. The flying monkey.
5. The boy who wants to be a nurse.
6. The girl who wants to be an engineer.
7. The cat that likes to swim.
8. The woman who swears like a sailor.
9. The man who wears lipstick.
10. The cow that brays like a donkey.

Scoring Procedures

In scoring, the following six criteria are used:

Organization

The production is judged on each of the following five sub-criteria and given either one or zero points on each of these. Therefore the best production on the "organization" criterion will be given five points, the poorest, zero.

The five dimensions of this criterion seem to be fairly closely inter-related with each other and one tends to score either one or zero all across at a breath. A production, however, may have good arrangement without being well balanced.

1-1. *Balance (Integration).* Is the production well balanced in its organization? Is it well integrated in that all of the parts contribute something to the story?

Score	*Description*	*Example*
0	Poor	"There was a duck that didn't try to quack. He didn't because it didn't know how to. Although he was an ordinary duck. He lives on the farm. I wonder why he doesn't quack?"
1	Good	"Once there was a dog named Rover. Rover was always barking. But, one day, Rover would not bark. They tried everything. Since Rover was afraid of strangers, they called up a person that his owners did not know. They asked this person they called, if he would walk pass their house at 12:05 p.m. because every day Rover would go to the window and bark and bark. Finally, they had to take Rover to the Dog Pond because he could not bark. And so that was the last time they saw Rover."

In the case of an unfinished production, integration or balance should be interpreted in terms of the part of the story already expressed. For a good example, see Example I in the Appendix.

1-2. *Arrangement (Order).* Is the production skillfully arranged in terms of its temporal and/or spacial sequence? Here score one whenever the author reports events in the order they would be expected to occur. If the production is very short (arbitrarily, less than fifty words), score zero on this dimension. A production need not be well balanced to rate high here.

Score	*Description*	*Example*
0	Poor	"The lion does not roar because he does not have a tongue to roar with. He bit his tongue eating meat because he was not careful eating his meat. The lion does not have a tongue because he doesn't watch out for his teeth. And he does not eat his food right."
1	Good	"It was the second week in third grade at Ringabell School. The children did not like school so they kept on being silly. One boy names Circus glued all the teacher's books together. Then a girl named Lamp put tacks on everybody's seat. All the boys flew paper rockets all over the room. The girls painted the teacher's desk and by mistake painted the teacher. The teacher really got mad then. When the teacher went out of the room to wash the paint off, the boy and girls all over the desk. When the teacher came back she saw them. Then she said,

'This is just too much.' So that is how Miss Jones stopped teaching."

1-3. *Consistency.* Is the production consistent in its efforts to give a story about one of the topics presented? Here score zero only in those cases where there is explicit contradiction or inconsistency in any part or parts of the production.

Score	*Description*	*Example*
0	Poor	"Once there was a dog who would never bark. His master's name was Joie. The dog always would go with his master. And he would never bark even at cats. He even went fishing with me. Of course the lake is right beside their house. We even tried out our new boat one nice sunny day."
1	Good	"Once upon a time there was a teacher named Miss Jones. She was a crabby old teacher. She made most of the children stay after to do her work. She didn't like any of the children so, when they had their lessons she gave them the wrong answers. None of the children liked her. So then the principal fired her. And that's why she stopped teaching."

1-4. *Conciseness.* Is the production wordy or parsimonious? It is not the length itself of the production which is to be considered here but rather its length in relation to its meaningfulness.

Score	*Description*	*Example*
0	Poor	"Once lived a lion that lived in a jungle. He roared all the time at night. He would squirm around and frighten all the animals in the jungle. Then one night a man from the zoo came through the jungle and put a lion trap in the jungle. After he had left the fierce and dangerous lion went to the trap to what is was and put its paw in the trap. The trap snapped and his paw was stuck. Then next morning the man came with a big cage for a lion. When he got there he found the fierce and dangerous lion there. He put him in the cage and went back to the zoo and put him in a bigger cage where people can see him. After that he didn't roar at all."
1	Good	"Once upon a time ere was a Lion that didn't roar. It was just like having laryngetts. The funny theng about it was he was supposed to be king of the beast and kings are supposed to roar. Every body laughed when they saw the king because he could not roar."

1-5. *Clarity (Communication).* Does the production clearly convey the writer's idea? Is the communication good? If you understand what the author is trying to say, score one here.

Score	*Description*	*Example*
0	Poor	"Du da dunda do. I'm Lieutenot Dracke. Me and my partner are working on the case of the rooster that doesn't crow. One early morning on May 1, 1960 about the time a rooster crows on the Daily Farm. There wasn't eny rooster th wake up the Daily family du da du duda."
1	Good	"This doctor was a funny fellow. He made the children laugh in every place he went. He made the children laugh so hard that they woke every body up. So the boss fired him. He liked to work with wood. So he became a carpenter.

A composite score is obtained by adding up these five subscores. This composite score on the "organization" criterion could thus be described as follows:

Score	*Description*
5	Excellent
4	Good
3	Fair
2	Poor
1	Very poor
0	Exceptionally poor

Sensitivity

The production is judged on each of the following five sub-criteria and given either one or zero point on each of these.

2-1. *Stimulus perception.* Is the subject sensitive to the original stimulus, namely, the presented sentence? Did he grasp what is required of him and what is given him? Here also pay attention to the way the subjects responded to the verb(s) used in the presented sentence. Remember that the dog is a dog who *won't* fight, not a dog who *can't* or *doesn't* fight; the woman is a woman who *can but won't talk*, not a woman who simply *can't* talk. When the subject ignores or overlooks this subtle but important phase, give him zero-point.

Score	*Description*	*Example*
0	Poor	"I once knew a dog that didn't bark because he had a cold. He try and try but could not bark. The dog chased a cat but he couldn't bark. And the cat could not scratch. The cat try to scratch. Soo they sat there."
1	Good	"Do you know why Miss Jones stopped teaching? It's because she wanted to thats why. Her kids noisy

and when she said be quiet they just said shutup. They wouldn't study and would never do their homework. They'd spit spitballs all over the room and they fought all the time."

2-2. *Association.* Did the subject react adequately to the stimuli which came up in his own production? Was his association smooth and relevant? This is a very elusive dimension; therefore, give a score of one unless the production is unusually queer or incoherent in its association.

Score	*Description*	*Example*
0	Poor	"I saw a dog one day and the dog saw cat. The dog tried to bark at the cat. He said what's wrong with you? I had my tonsils taken out of the dog. He was a hard egg head."
1	Good	"One upon a time, there was a lion who couldn't roar. He name was Big Bill. The men found Big Bill in Africa when he was just a lion cub. When he was fullgrown they found that he couldn't roar. So they thought they better call the animal doctor. The animal doctor said, 'I don't know what is the matter with this lion, we had better call my partner,' he said. 'He is more advanced than I am.' So they called the doctors partner. Soon the other doctor came. 'I can't find anything wrong with this lion,' he said we better call a specialist. Soon the specialist came. I also can not find anything wrong with Big Bill. While all this was going on there was a little boy teasing Big Bill. Finally Big Bill got so mad, he roared."

2-3. *Relevancy of ideas.* Is the idea(s) presented relevant? Are the ideas contributing something to the overall production? Arethey essential? Are they marginal, peripheral, or totally irrelevant, or are they central? If most of the presented ideas are relevant, score one here.

Score	*Description*	*Example*
0	Poor	"Du da dunda do. I'm lieutenot Dracke. Me and my partner are working on the case of the rooster that doesn't crow. One early morning on May 1, 1960 about the time a rooster crows. On the Daily Farm. There wasn't eny rooster th wake up the Daily family da du da duda."
1	Good	"One day a cat came walking into Fish Town. The same day a woman saw the cat and bent down to pick up the cat. The woman thought the cat would

scratch her but he did not scratch her. She was so surprised that she jumped.'"

2-4. *Specificity.* Is the production specific in its important details? Is it detailed in its exposition of the central ideas?

Score	*Description*	*Example*
0	Poor	"Once there was a dog named Top. The only thing that was wrong with him was he couldn't bark. Every afternoon he would be sitting on the steps he would be so angry. Do you know why he wouldn't bark? Well I might as well tell you. Well you see the owner of the dog was a dog himself. But he really wasn't a dog. Well I guess we better get to the part why the dog didn't bark. He didn't have no tongue. If you didn't have no tongue. you couldn't talk."
1	Good	"One upon a time there was a lion. He was very hungry. Just then he saw an elphant he thought that he coult eat it. So he jumped on it. The elphant took the lion and threw it against a tree. The fell down. Two monkeys threw fifty bananas in his mouth and he got laryngitis. So thats why he doesn't roar."

2-5. *Empathy.* Does the subject show some empathy with the principal character in his production? Score one here whenever there is explicit description of how the character feels or felt (e.g., "He was very sad," "She was afraid of ...."). When some emotion or feeling is explicity ascribed to a character in the story, or when the character, in direct narration, expresses his emotion, a score of one is given.

Score	*Description*	*Example*
0	Poor	"Once upon a time there lived a doctor. He had lots of money then heard that he had to operate on somebody. He didn't want to do this but a man said he had to or he'd fire him. But the doctor still wouldn't do it. So then the man fired him and the doctor became a carpenter. He knew how to build houses good. And thats how the doctor became a carpenter."
1	Good	"One day when the children came to school Miss Jones was not there. There was a new teacher there the children asked where was Miss Jones. The teacher told them that she had stopped teaching. That afternoon the children were sad. Then Miss Jones came in to say good-by but the children would not let her go. They didn't want her to go. When she got to the door she said that she would stay. All the children ran and were happy the rest of the year.

A composite score for "sensitivity" is obtained by adding up these five subscores.

Originality

The production is judged on each of the following five subcriteria and given either one or zero point on each of these.

3-1. *Choice of topic.* Scoring on this criterion is entirely dependent upon the frequencies of each topic being chosen out of the ten possible choices.

Score	*Description*	*Specification*	*Example*
0	Poor	Form A - Male	Topic 1. The dog that doesn't bark.
			Topic 2. The man who cries.
			Topic 6. The doctor who became a carpenter.
			Topic 8. The horse that won't run.
			Topic 10. The lion that doesn't roar.
		Form A - Female	Topic 1. The dog that doesn't bark.
			Topic 2. The man who cries.
			Topic 3. The man who can but won't talk.
			Topic 5. Miss Jones stopped teaching.
			Topic 8. The horse that won't run.
			Topic 10. The lion that doesn't roar.
		Form B - Male	Topic 1. The teacher who doesn't talk.
			Topic 3. The dog that won't fight.
			Topic 4. The flying monkey.
			Topic 7. The cat that likes to swim.
			Topic 8. The woman who swears like a sailor.
			Topic 9. The man who wears lipstick.
		Form B - Female	Topic 1. The teacher who doesn't talk.
			Topic 4. The flying monkey.
			Topic 7. The cat that likes to swim.
			Topic 9. The man who wears lipstick.
1	Good	Form B - Male	Topic 3. The woman who can but won't talk.
			Topic 4. The cat that doesn't scratch.
			Topic 5. Miss Jones stopped teaching.
			Topic 7. The rooster that doesn't crow.
			Topic 9. The duck that doesn't quack.
			Self-developed topics.

Form A - Female	Topic 4.	The cat that doesn't scratch.
	Topic 6.	The doctor who became a carpenter.
	Topic 7.	The rooster that doesn't crow.
	Topic 9.	The duck that doesn't quack.
		Self-developed topics.
Form B - Male	Topic 2.	The hen that crows.
	Topic 5.	The boy who wants to be a nurse.
	Topic 6.	The girl who wants to be an engineer.
	Topic 10.	The cow that brays like a donkey.
		Self-developed topics
Form B - Female	Topic 2.	The hen that crows.
	Topic 3.	The dog that won't fight.
	Topic 5.	The boy who wants to be a nurse.
	Topic 6.	The girl who wants to be an engineer.
	Topic 8.	The woman who swears like a sailor.
	Topic 10.	The cow that brays like a donkey.
		Self-developed topics.

The provisional scoring scheme described in the preceding pages was based upon the responses gathered from 1,061 subjects of 3rd through 6th grades in the Twin Cities area. It was decided quite arbitrarily that those topics chosen by more than ten per cent of respondents who used any one of the given ten topics be given a score of zero, and the remaining topics and self-developed topics, a score of one.

Distributions of responses according to the test form, topic, and respondent's sex, are given in the following page.

Table 28

Distribution of responses according to test form, topic, and respondent's sex.

Form A

Topic		Male		Female	
		Frequency	Percentage	Frequency	Percentage
1		46	18.62	43	15.30
2		25	10.12	34	12.10
3		12	4.86	34	12.10
4		6	2.43	19	6.76
5		24	9.72	48	17.08
6		30	12.15	21	7.47
7		13	5.26	9	3.20
8		34	13.77	29	10.32
9		7	2.83	12	4.27
10		50	20.24	32	11.39
	Subtotal	247	100.00	281	100.00
	Self	13		13	
	TOTAL	260		294	

Form B

Topic		Male		Female	
		Frequency	Percentage	Frequency	Percentage
1		25	11.68	52	19.06
2		15	7.01	7	2.52
3		23	10.75	19	6.83
4		63	29.44	34	12.23
5		4	1.87	19	6.83
6		7	3.27	6	2.16
7		22	10.28	30	10.79
8		23	10.75	4	1.44
9		26	12.15	90	32.37
10		6	2.80	16	5.76
	Subtotal	214	100.00	278	100.00
	Self	32		30	
	TOTAL	246		308	

3-2. *Idea(s).* Is the main idea presented novel or unusual? Is it stereotyped and common? Undoubtedly, in the near future, some thorough-going frequency counts will give us precise definition of novelty or commonness of an idea. At present, however, the only thing we can do is to give some examples or recurring ideas and schemes.

> "The dog couldn't bark. He tried and tried, but he couldn't bark."
> "The doctor quit medicine because he didn't like it. He became a carpenter."
> "The man cries because he peeled onions."
> "Lion got so mad and finally roared."
> "Lion could only squeak and everybody made fun of him."
> "Miss Jones stopped teaching because she couldn't stand her naughty, noisy, intractable children."
> "The man wears lipstick because he couldn't get it off."

As a rule of thumb, we used an arbitrary cutting level based upon the following simple frequency counts. Any idea which occurred more frequently than ten per cent in the responses to any given topic should be given a score of zero, unless that idea is used as a fractional portion of a highly creative production.

In this frequency tabulation, those ideas which occurred more than once in response to each given topic were counted and their percentages to the total response frequency under that particular topic were computed. Score zero, therefore, whenever this percentage figure surpasses or equals ten per cent. Also, for purposes of this tabulation, such ideas have been divided into two categories. The first of these contains all ideas that are in the form of a reason for, or a cause *of*, the condition specified in the topic title. These are referred to as *explanatory ideas* and are preceded by (E) in the tabulation. All other ideas fall in the second category and are referred to as *descriptive ideas*. These are preceded by (D).

This frequency count is based upon the responses gathered from 1,116 subjects of the third through sixth grades in the Twin Cities area. Of these responses, 625 are on Form A, and 491 are on Form B. The responses to individual topics and percentages thereof are tabulated on the next pages. All self-developed topics have been excluded.

Table 29

Frequency of main ideas according to test forms and topic based on 1116 subjects.

Form A

Topic 1: The Dog That Doesn't Bark (N =99)

Ideas	Freq.	% of N
(E) Something is stuck in his throat	5	5
(E) He is frightened	4	4
(D) He talks instead	6	6
(D) He is involved with a burglar or robber	5	5
TOTAL	20	20

Topic 2: The Man Who Cries (N =67)

Ideas	Freq.	% of N
(E) He has been exposed to onions	11	16
(D) He cries huge amounts of water	4	6
(D) He started crying when he was young and never stopped	4	6
(D) He laughs when he should cry, and vice versa	2	3
TOTAL	21	31

Topic 3: The Woman Who Can But Won't Talk (N =55)

Ideas	Freq.	% of N
(E) She has a spell cast on her	4	7
(E) She is traumatized	2	4
(D) She talks excessively at first	8	15
TOTAL	14	25

Topic 4: The Cat That Doesn't Scratch (N =33)

Idea	Freq.	% of N
(E) He (she) is frightened	2	6
TOTAL	2	6

Topic 5: Miss Jones Stopped Teaching (N =93)

Ideas	Freq.	% of N
(E) Her pupils are naughty or intractable	45	48
TOTAL	45	48

Topic 6: The Doctor Who Became a Carpenter (N =60)

Ideas	Freq.	% of N
(E) He does not like being a doctor	9	15
(E) He got fired	4	7
(D) He treats patients with carpenter tools or as if they were building materials	12	20
(D) He treats building materials medically	4	7
TOTAL	29	48

Topic 7: The Rooster That Doesn't Crow (N =24)

Idea	Freq.	% of N
(E) He swallowed something	3	12
TOTAL	3	12

Topic 8: The Horse That Won't Run (N =72)

Idea	Freq.	% of N
(E) He is uncooperative or lazy	6	8
TOTAL	6	8

Topic 9: The Duck That Doesn't Quack (N =23)

Idea	Freq.	% of N
(E) He swallowed something or has something caught in his throat	5	22
TOTAL	5	22

Topic 10: The Lion That Doesn't Roar (N =99)

Ideas	Freq.	% of N
(E) He is shy, timid, frightened, etc.	19	19
(E) He has something caught in his throat	4	4
(E) He has laryngitis	4	4
(D) He squeaks or tweets (and the other animals laugh)	7	7
(D) His name is Leo	7	7
(D) He has experiences with mice	5	5
(D) He consults an owl	2	2
TOTAL	48	48

Form B

Topic 1: The Teacher Who Doesn't Talk (N =77)

Ideas	Freq.	% of N
(E) She lost her voice shouting at children	6	8
(E) She has a throad ailment	6	8
(E) She was frightened	5	6
(E) She talked too much, earlier	4	5
(E) She was in an accident	3	4
(E) She never learned how to talk	3	4
(E) Children threw objects into her mouth	3	4
(E) A spell was cast on her	2	3
(D) She communicated by writing	15	19
(D) She couldn't control her class	9	12
(D) The children's parents were interested in her case	5	6
(D) She used sign language to communicate	2	3
(D) She begins talking and won't stop	3	4
(D) She gets married	3	3
TOTAL	67	87

Topic 2: The Hen That Crows (N =22)

Ideas	Freq.	% of N
(E) She was hatched by a rooster	3	14
(E) She was really a rooster	2	9
(E) She ate a crow or turned into a crow	3	14
(E) She exchanged roles with a rooster	2	9
TOTAL	10	45

Topic 3: The Dog That Won't Fight (N =42)

	Ideas	Freq.	% of N
(E)	He is too cowardly, frightened, or too much a "mama's boy"	17	40
(E)	He is polite or peace-loving	6	14
(D)	He is picked on by "tough dog(s)"	5	12
(D)	He finally gets tough	6	14
	TOTAL	34	81

Topic 4: The Flying Monkey (N =97)

	Ideas	Freq.	% of N
(E)	He is used in rocket research, travels space, or lives on another planet	9	9
(E)	He wished he could fly	6	6
(E)	He took pills or potion	4	4
(E)	He kept jumping till he flew	3	3
(E)	He was adopted by a bird or took lessons from one	3	3
(E)	He ate a bird egg or bird(s)	3	3
(E)	He hatched from a bird egg, or was otherwise crossed with a bird	3	3
(E)	He was given the power to fly by a witch or medicine man	3	3
(E)	He was created by a man	2	2
(E)	He flies in an airplane	2	2
(E)	He used leaves as wings	2	2
(E)	He flies with his ears	2	2
(E)	He flies to escape danger	2	2
(E)	He wakes up and finds he has been dreaming	2	2
(D)	He joins (or is in) a circus	5	5
(D)	He talks	4	4
(D)	He helps people or animals	4	4
(D)	Other animals dislike him	4	4
(D)	His mother disowns him	3	3
(D)	He wants to be a pilot or thinks he is one	2	2
(D)	He consults an owl	2	2
(D)	He marries and has little winged monkeys	2	2
(D)	He grows to be huge	2	2
	TOTAL	74	76

Topic 5: The Boy Who Wants to be a Nurse (N = 23)

	Ideas	Freq.	% of N
(E)	He likes girls, girls' play, or plays with girls	5	22
(E)	He likes nurses	2	9
(D)	He argues with his parent(s)	4	17
(D)	Other people laugh at his silly idea or tease him	3	13
	TOTAL	14	61

Topic 6: The Girl Who Wants to be an Engineer (N = 13)

	Ideas	Freq.	% of N
(E)	She is a tomboy	2	15
(D)	She 'engineers' a train	4	31
(D)	People think the idea odd	4	31
	TOTAL	10	77

Topic 7: The Cat That Likes to Swim (N = 52)

	Ideas	Freq.	% of N
(E)	He went into the water to escape	6	12
(E)	He jumped into the water after the fish	5	10
(E)	He fell into the water accidentally	4	8
(E)	He was victimized by mice	3	6
(D)	He catches fish	5	10
(D)	He is laughed at	3	6
(D)	He makes friends with fish	3	6
(D)	He saves someone from drowning	3	6
(D)	He wants to be a fish	2	4
(D)	He drowns	2	4
	TOTAL	36	69

Topic 8: The Woman Who Swears Like a Sailor (N =27)

Ideas	Freq.	% of N
(D) She is related to a sailor	3	11
(D) She has no friends	3	11
(D) She is put in jail	3	11
(D) She wants to be a sailor	3	11
(D) She swears at law officers	2	7
(D) She swears at children	2	7
(D) She becomes intoxicated	2	7
(D) She enters a swearing contest	2	7
TOTAL	20	74

Topic 9: The Man Who Wears Lipstick (N =116)

Ideas	Freq.	% of N
(E) He thinks he is a girl (woman) or he wants to be one	11	9
(E) He thinks he looks nice with lipstick on	9	8
(E) He is a movie star or actor	9	8
(E) He is a clown or wants to be one	7	6
(E) He likes lipstick on others and tries it out	6	5
(E) He kisses girl(s) (woman/women) with lipstick on	5	4
(E) He uses it to alleviate chapped or burned condition of lips	5	4
(E) He goes to a masquerade as a woman	4	3
(E) He wears it to improve or discolored lips	4	3
(E) He finds his mother's lipstick and tries it out	3	3
(E) He uses lipstick as part of a disguise for nefarious purposes	3	3
(E) He trades roles with a woman	2	2
(D) He is teased or laughed at	19	16
(D) The lipstick won't come off	15	13
(D) He wears or experiments with different shades of lipstick	7	6
(D) Others think he is crazy	6	5
(D) He gets used to wearing it and leaves it on	5	4
(D) People scream at the sight of him	4	3
(D) He buys large quantities of lipstick	4	3
(D) He wears his wife's lipstick	4	3
(D) His wife doesn't like his wearing lipstick	4	3
(D) He marries another man	4	3
(D) He doesn't like lipstick on girls (women)	3	3
(D) He buys lipstick at a store	3	3
(D) He wants to get married	2	2
(D) He is changed into a girl (woman)	2	2
TOTAL	150	129

Topic 10: The Cow That Brays Like a Donkey (N =22)

	Ideas	Freq.	% of N
(E)	She learned to bray from donkey (step-) parent(s)	3	14
(E)	She is really a donkey or part donkey	2	9
(D)	She is examined by doctor(s)	5	23
	TOTAL	10	45

3-3. *Organization.* Is his way of organizing his materials governed by traditional story-telling form? A score of zero should be given whenever some stereotyped forms such as "Once upon a time there was...," "...and they lived happily thereafter," and "...so this is the end of the story of..." are used in the production. The fact that these stereotypes occur in the majority of cases is seen from the following table based on 609 protocols. It is observed that: (1) nearly 80 per cent of productions in the third through fifth grades start with one of these common forms. There appears a sharp drop, however, between the fifth and sixth grades and frequency of stereotyped beginnings decrease to about a half of cases; (2) in males, a peak is reached at the fifth grade level while, in female, this peak is reached at the fourth grade level; (3) about one half of these beginnings are in the form, "Once...," "There once was...," or "There was once..."

Table 30

Frequency of Stereotyped Beginning Phrases for Each Grade and Sex, Based on 609 Subjects.

Beginning phrase	Grade								
	3 (N=23)		4 (N=113)		5 (N=329)		6 (N=144)		Total (N 609)
	M(8)	F(15)	M(55)	F(58)	M(148)	F(181)	M(68)	F(76)	
"Once upon a time"	12	20	27	21	26	17	10	11	19
"Once," "There once," and "There was once"	50	47	38	48	47	40	29	24	39
"One day," "One time," and the like	12	13	5	14	8	11	21	9	11
"There is," "There was"	0	0	2	2	7	4	0	5	4
Total	75	80	73	84	88	71	60	49	
Grade Total	78		79		79		54		73

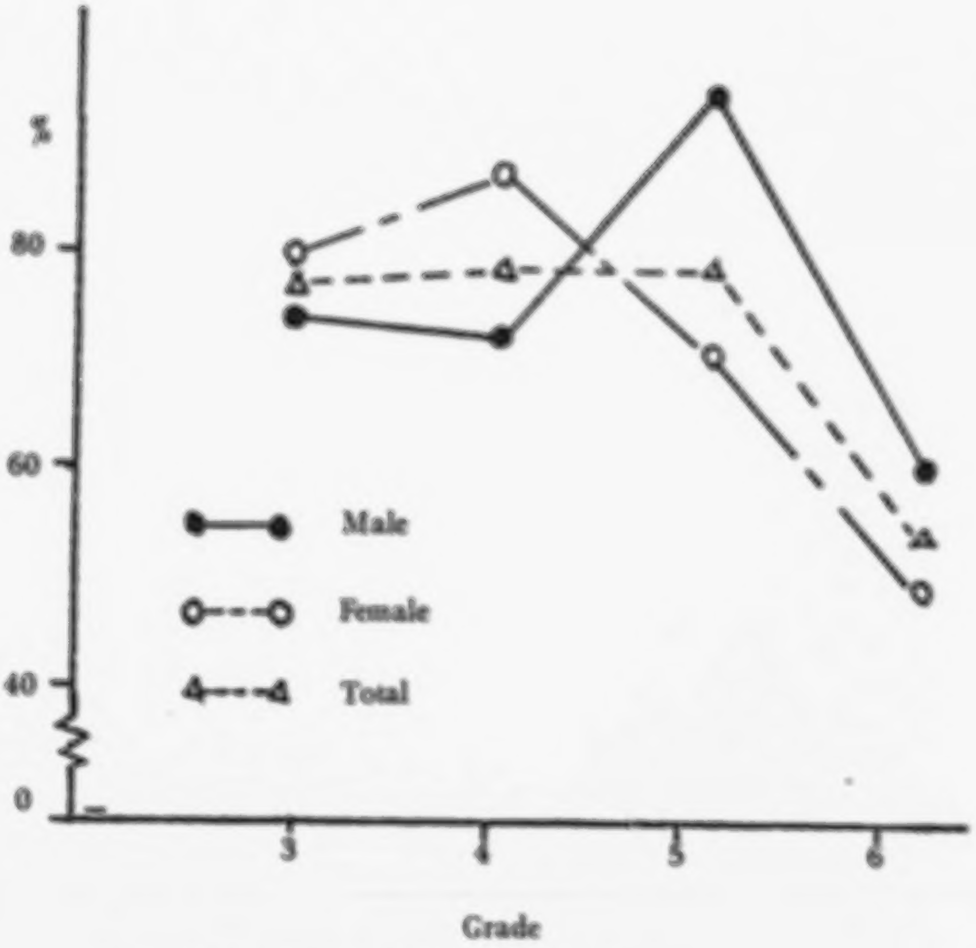

Figure 1. Frequency of stereotyped Beginnings

Score	*Description*	*Example*
0	Poor	"Once upon a time there was a horse that would not run. Then one day he saw a horse running. And then he strated to run with him. An then they did run almost every day because that one horse teached him. And then one day that horse that won't run started to get lazy and lazy and then he stayed in his barn. And that is the end of the horse that wouldn't run.
		"Do you know why Miss Jones stopped teaching? It's because she wanted to thats why. Her kids nosy and when she said be quiet they just said shutup. They wouldn't study and would never do their homework. They'd spit spitballs all over the room and they fought all the time."

3-4. *Style of writing.* Does the subject show any sign of original style of writing? This dimension has no objective rationale yet and, therefore, it is a very difficult one to judge. Give a score of one whenever the subject uses direct narrative sentences or quoted dialogues.

Score	*Description*	*Example*
0	Poor	"I saw a dog one day and the dog saw cat. The dog tried to bark at the cat. He said what's wrong with you? I had my tonsils taken out of the dog. He was a hard egg head."
0	Poor	"He started to swear, then she started to swear. Then their children started to swear and then all people started to swear." (Repetitive use of "then")
1	Good	"On March 28, at about 2:00 Miss Jones was reading a story called 'Treasure Island' to her class. This was in 'Wonder School, St. Cloud, Minnesota.' She closed the book and practickly all of the class groaned. Then Betty spoke up, 'Don't stop now, Miss Jones, it's just getting exciting!' Betty could see that the whole class was with her because all of the boys were yelling and the girls were screaming. Miss Jones spoke over the loud voices 'Children, Children, *please!*' The room was still. 'I have an announcement to make,' she went on, 'I have decided that I must move to live with my mother in Northfield, she is very ill and I must leave tomorrow. For a new teacher our principal Mr. Machulda, will take the class until they can find a substitute teacher. I will be gone for four months.' There was a lot of commotion. Then she said 'As a sort of Goodbye

period we will have a spelldown. The person who wins will get all my marbles in which I have collected during the year.'

I would like to tell more! I have alot in my head but no time."

3-5. *Sense of humor.* Is the production humorous or surprising? There could be much discussion on what constitutes humor. Granted this criterion is fairly subjective, we construe it as meaning "surprising" or pleasantly surprising.

Score	*Description*	*Example*
0	Poor	"There was once a dog that didn't bark. He had forgot how to bark because he didn't try to bark enough. So one day a little girl came to visit her cousin and the dog that could not bark and she said to the dog that if he didn't bark she would kick him. So he tried as hard as he could to bark but he could not do it and besides he was out of breath so he had to have that kick that the little girl said she would give him. The next day her little baby sister came over to play and she thought that the dog was a pony. So the next day he finally did bark so here is the end of the story of the dog that doesn't bark."
		"Once upon a time there was a doctor. Now this doctor wasn't happy with his work. He wanted to be a carpenter. He didn't want to help people, instead he to build houses. One day a man came to the office, he was feeling sick. He asked the doctor to cut him open. So the doctor went to his house and when he returned he had a carpenter's saw in his hand and a chisel in his other hand. The man that was sick ran out of the office as fast as he could. And the doctor became a carpenter."
		"There was once a lion that was proud that he was a lion because he could roar. He could roar so loud that the jungle shook and the fruit and leaves fell from the tree. The other animals when crazy buying earplugs. One day he roared so loud that his voice box can't take it and broke. The other animals were so happy that his voice box broke. But there were three animals that weren't happy because they were the ones who made the earplugs."

A composite score for "Originality" is obtained by adding up these five subscores.

Imagination

The production is judged on each of the following five sub-criteria and given either one or zero point on each of these.

4-1. *Imagination.* Does the subject show rich imagination or is his imaginative ability scarce and limited? Is the subject able to "associate away from" the original stimulus or is he bound to it? Score one whenever the subject develops the topic to some extent and does not appear to be "in a rut."

Score	*Description*	*Example*
0	Poor	"Once upon a time there was a dog that wouldn't bark. The dogs name was Barky. Barky never played with dogs or didn't get mad at cats. He was a friendly dog. When children came and played Barky played too. One day Barky started to bark. All the children were glad."
		"Once upon a time there was a lady who swore like a sailor because she would get drunk an offel lot and swear like a sailor. So after a few years of this she got her name and that was the woman who swears like a sailor well it got so bad that even the children started her the woman who swears like a sailor. The dogs would bark at her when she past so she dicided to more to another city so she did. Then she got to another city she got know the people and was invited to some parties there she got drunk also then began to swear like a sailor then after a few years the people there started to call her the woman who swears like a sailor and the children began to call her the woman who swore like a sailor and then the dogs began to bark at her when she passed them. So she dicided to move away far away and no one ever heard of her again."

(In this production, the subject does not have flexible imagination. Although he is quite fluent, in terms of amount written, he does not develop the topic well. He is unable to "associate away from the original stimulus."

Score	*Description*	*Example*
1	Good	"Once out of the sky came a comet it hit the deck of a ship called the U. S. S. Swearfish. It was called that because the sailors abord always swore. The comet has come from Mars'es moon. It was a satelite of a tiny race called the moonerabians. It was set to record anything it heard. One day they (the people from the swearfish) hired a scrub woman. One day as she was scrubbing. She was talking

around and she skipped on a bar of soap. She fell agenst the satelite and it got tangled up in her hair. She had hit her head so hard that she had to have a brain operation. While she was having her operation the satelite fell into her brain. As it fell it tripped its reverse gear and started playing back everything it heard. and that is how the woman swore like a sailor. The End."

4-2. *Fantasy.* Is the production strictly on the factual basis or rich in fantasy? The question to be asked in scoring this dimension is: "Could this really happen?" A production in which animals are talking to each other or to people is worth a score of one. It must be pointed out here that there may be *Imagination* without *Fantasy*, but, by definition, *Fantasy* implies *Imagination*.

Score	*Description*	*Example*
0	Poor	"Once upon a time there lived a doctor. He had lots of money then heard that he had to operate on somebody. He didn't want to do this but a man said he had to or he'd fire him. But the doctor stil wouldn't do it. So then the man fired him and the doctor became a carpenter. He knew how to build houses good. And thats how the doctor became a carpenter."
1	Good	"One time long ago there was a dog that didn't bark. He talked like a human being. All the other animals on the farm thought that he was very queer. His owner didn't think that at all. Whenever someone strange came around the dog sat where he was. The owner never knew when anyone came around, because the dog didn't bark. The dog's name was Sparks and his owner's name was Mr. Jones."

4-3. *Abstraction.* Is the production high on the abstraction ladder? Is it attached to the natural phenomenon or is it logically more abstract? Give a score of one to all generalizations such as "all lions roar," or "cats don't like water." Also score one when the characters involved are named in a manner symbolic of their roles. For example, a nurse being named "Miss Getwell" or a lion that doesn't roar named "Quiet."

Score	*Description*	*Example*
0	Poor	"Once upon a time there was a dog that wouldn't bark. The dogs name was barky. Barky never played with dogs or didn't get mad at cats He was a friendly dog. When children came and played Barky played too. One day Barky started to bark. All the children were glad."

1	Good	"Once upon a time ere was a Lion that didn't roar. It was just like having laryngetts. The funny theng about it was he was supposed to be king of the beast and kings are suppose to roar. Every body laughed when they saw the king because he could not roar."
1	Good	"Well, there was once a man who would always cry. His name was Mr. Tear Drop. Of corce that was what his ma called him. He never talked right but, he always. One day an idea struck him. He said while he was crying "I am going to stop crying." But, he never could. Finally a witch doctor came from a far off indian village named, "Wise Doctor Village." He said, "You are heap sick pale face." But Mr. Tear Drop just wouldn't stop shedding tears. Mr. Witch Docter sighed, "I go crazy if you don't stop." Mr. Tear Drop replied, "Im am crazy already!" Tear by tear came rolling by and by. But, he never stopped."

4-4. *Identification.* Did the subject identify the principal character(s) in his story with proper name(s)?

Score	*Description*	*Example*
0	Poor	"This doctor was a funny fellow. He made the children laugh in every place he went. He made the children laugh so hard that they woke every body up. So the boss fired him. He liked to work with wood. So he became a carpenter."
		"Once there was a dog named Rover. Rover was always barking. But, one day, Rover would not bark. They tried everything. Since Rover was afraid of strangers, they called up a person that his owners did not know. They asked this person they called, if he would walk pass their house at 12:05 p.m. because every day Rover would go to the wondow and bark and bark and bark. Finally, they had to take Rover to the Dog Pond because he could not bark. And so, that was the last time they saw Rover."

In the case of the fifth topic on Form A, "Miss. Jones stopped teaching," some reference to, say, the name of school as shown in the example under 1-2. Arrangement, Score 1, is desireable.

4-5. *Reasoning.* Did the subject give any reason for the phenomenon described in the stimulus sentence or did he simply accept it as it was? In some self-developed topics this dimension is not applicable. In such cases, give a score of zero here.

Score	*Description*	*Example*
0	Poor	"Once there was a dog who would never bark. His master's name was Join. The dog always would go with his master went. And he would never bark even at cats. He even wen fishing me. Of course the lake is right beside their house. We even tried out our new boat one nice sunny day."
1	Good	"Once there was a lion who could not roar. The reason why he couldn't roar was because he swallowed a man. The man's name was Jim. He was a lion trainer He had an act of putting his head in the lion's mouth. One day the lion was very hungry and when Jim put his in the lion's mouth the lion swallowed him and then the police came. They pulled and pulled but could not get him out. They never got him out. For all we know he is still in the lion's mouth."

A composite score for "Imagination" is obtained by adding up these five subscores.

Psychological insight

The production is judged on each of the following sub-criteria and given either one or zero point on each of these.

5-1. *Causal explanation.* Did the subject give a physical (organic) cause to explain the phenomenon described in the stimulus sentence or a non-physical (functional) reason? There is often some doubt as to whether a given reason is organic or functional. In such a case, give one. In self-developed topics, where the Reasoning dimension is not applicable, score zero.

Score	*Description*	*Example*
0	Poor	"The lion does not roar because he does not have a tongue to roar with. He bit his tongue eating meat because he was not careful eating his meat. The lion does not have a tongue because he doesn't watch out for his teeth. And he does not eat his food right."
1	Good	"Once there was a doctor. He was a doctor for 12 years. One day he said, "I don't want to be a doctor any more it isn't fun cutting people open and looking at the insides." Then somebody came to the doctor's house one night. A pole fell down from the storm. It fell right on a car with six people in it. The doctor said, "I'll be right there. He called the ambulance. The ambulance took the people to the Hospital. Oh no I'm not going to the Hospital ok I will. When the doctor was there he had to cut the person's body and look at his insides. Then at morning he was going to work for carpenter work. He first customer

was a lady. She said, "I want a carpenter on my floor. Then the man start put. All the time he would pound on his fingers."

5-2. *Perspective.* Did the subject show any perspective in terms of how and when, say, "the dog that doesn't bark" would start barking again? This might be termed "restoration of equilibrium". Also score one here whenever the subject states the long-term perspective about his principal character(s) in his story, whether this "normalizes" or not. "Living happily ever after" is not enough, incidentally, unless the subject shows *how* this was possible.

Score	*Description*	*Example*
0	Poor	"There was a duck that didn't try to quack. He didn't because it didn't know how to. Although he was an ordinary duck. He lives on a farm. I wonder why he doesn't quack?"
1	Good	"Once upon a time there lived an old woman who can but won't talk. Her husband said he would pay 2,000 dollars if they could make her talk. He said if she can laugh or cry she could try. Everyone tried it but no one could do it. Some people even tried to scare her with masks, they broke all her good things she had. One day an old man came to that town and he heard about this. He said may I try to make her talk, after awile he got to the house of the old woman and went in with a bowl of onions and a knife, after awhile her husband heard her crying and both of them lived happily ever after."

5-3. *Meaningfulness.* Is the production meaningful as a whole? Here we are most dramatically confronted with a choice situation between social and psychological, or adult and child, criteria of creative ability, and, unfortunately, do not have any clear-cut answer. Score, therefore, one here unless the production is totally incoherent and nonsense. The following and similar stereotypes should, however, be scored zero on this dimension.

"Once there was a man who cried. He didn't know why. Then all of a sudden he stopped crying."

"There was a lion who couldn't roar. He tried and tried but he couldn't."

Score	*Description*	*Example*
0	Poor	"There was a doctor who became a Carpenter. One day Mr. Joe came home from work from the doctores office and he said wife I'm going to be a carpenter. But I think he was sorta mad like a mad docter a Tv. But soon he became to like a carpenter and I sort of confused of what he was going to do. His wife had a idea. Why don't you go to another doctor,

		and he will tell you what to do. So the next morning he went down to the other doctor and he said you will be a carpenter. So they were all every lasting."
1	Good	"Once upon a time there lived a doctor. He realized being a doctor wasn't fun. So he started working at home on being a carpenter. He forgot he was a doctor and was thinking he was a carpenter. He went outside and got a saw. Then he came back. Then the man saw the saw and ran out to his speedboat and raced away. And that's how the doctor became a carpenter.

5-4. *Ego-involvement.* Is there any self-reference? Does the subject speak of his own experience?

Score	*Description*	*Example*
0	Poor	"Every day mike the dog had a fight. But it was always with a smaler dog, and he always wone. One day he got madie at a big dog and the big dog bitted he up. From that day on mike always keept out of fights. The End."
1	Good	"I have a cat that likes to swim, in fact he's a better swimmer than I am. My cat first learned to swim when I enrolled him in the C. S. A. (Cat's swimming association). At first it was a job trying to get him ready for lessons, but now its different if he's sick he even begs to go. My cat is an excellent swimmer he has won 19 ribbons. He takes his lesson every night of the week for four hours. He doesn't complain though. He can swim 900 yards without getting tired. One day I was going to race him in swimming. I thought I would win because he was so tired. But I was wrong he beat me. Every afternoon I take him down to the beach for a swim. At first I loved it but after awhile carrying that cat can be heavy. Now my cat is hated by all the lifeguards. Do you know why? That's right he's saved more people than 20 lifeguards. My cat likes to swim alright, last year he entered 25 swimming contests and won everyone. (He raced against the world's fastest swimmers.) But my cat has come to its end last week he drowned in our small swimming pool in the back yard."

5-5. *Understanding.* Does the production show deep understanding of the life situation described? Here the subject is judged for his insight into complex interpersonal (be it expressed in term of animals involved) relationships. This calls for a sort of reality testing on the part of the subject.

Score	*Description*	*Example*
0	Poor	"One night it was cold and very dark. The cat was awful lonesome, and he was tired. That night the cat went to the hot house, and he saw alot of fire flies, and he asked them if they would make friends (because I told you he was lonely.) But do you know what happened! they thought he was a fire flie, so they sat on him, and they wouldn't get off. So the next morning, he went into the house, and he couldn't scratch, orelse he would have a hot foot."
1	Good	"Place: In a department store. Time: Christmas 'And what do you want for Christmas, little girl?" asked Santa Claus. 'Nothing,' said the little girl. Her name was Nancy. 'Oh, there must be something,' said Santa Claus. 'Well, as a matter of a fact there is,' said Nancy. 'What?' asked Santa Claus. 'I want to be an engineer,' seven-year old Nancy said. 'Well, maybe Santa will bring you that,' he said doubtfully. All through Nancy's life she wanted to be an engineer. In the past, her mother let her go as being an engineer. But now she was entering Senior High-School. 'You must decide on a career, my dear,' her father said sternly. 'But I have, I want to be an engineer,' replied Nancy. She grieved her parents so much that they let her study engineering. All the boys laughed at her but she didn't care. She was determined to be an engineer. She went through college and high school and passed with highest honors. Although people thought it odd, she became a very successful engineer, to the surprise of everyone."

A composite score is obtained by adding up these five subscores, as with the other criteria.

Richness

The production is judged on each of the following sub-criteria and given either one or zero point on each of these.

6-1. *Expression.* Literally speaking, is the production rich in its expression? Does it describe things carefully and/or colorfully?

Score	*Description*	*Example*
0	Poor	"Once there was a farmer that had a horse. and this horse could do many things. but there was One thing that he couldn't do. and that was run. and if you

		tryed every thing to make him run it wood not work. as one day a man told the farmer if he wood sell, and the farmer told the man that he could have the horse for $20 dollers."
1	Good	"The rooster that doesn't crow is a very odd story. It all started when the farmer bought him when he was small. The farmer took him home and put him in the barn it just had a little tiny window. The rooster slept on the hay. One day he woke up and a bog wagon was in front of the window. He thought it was still night so he ate and went back to sleep. The next day he woke up and he through it was still night so he ate and went back to sleep. And that is the story why the rooster doesn't crow."

6-2. *Ideas*. Is the subject rich in ideas? Has he many ideas? The number, rather than quality or integrity, of ideas is to be considered here.

Score	*Description*	*Example*
0	Poor	"When Miss. Jones was out of highschool she went to college to learn how to be a teacher. When she was done college she went to Ely Minnesota to teach school. She teached at Franklen School. She was a good teacher expect one thing she was always singing the wrong notes in singing. So the teacher in the next room said 'I'll teach singing for your class. Any everything worked out ok. Then a new boy moved in and he was not a smart boy. One day he made the teacher cry in front of the whole class and She didn't teach any more. The End."
1	Good	"Once there was a horse that wouldn't run. No one knew why, he just wouldn't run. But one day in the village of Junkinberg (the village where he lived) came an old man. The old man said he would try to make him run. The man, (whose name was Herman Twitterwell) went into the barn where the horse was kept, and when he saw him he jumped with glee, for this was his old horse which he had sold to a farmer. He knew what would make the horse run spinch good, lovely spinach. So he went out and bought five pounds of spinach, he fed them to the horse, and the horse was the fastest in the world. Do you know one of the reasons why? because the horses name was J. C. Spinch the third. Ane he was the fastest horse until he died, and he died eating spinach. So if you ever pass through the village of Junkinberg

plan to visit the grave of J. C. Spinch the third for there you will see a wonderful sight."

6-3. *Emotion.* Is the production rich in its expression of emotion? Score one here whenever the subject shows commiseration to his characters and/or his story. On the *Empathy* dimension, we look for explicit emotion ascribed to principal characters but here on this dimension, we are primarily interested in direct expression of subject's own emotion. Expression might be quite explicit or rather implicit.

Score	*Description*	*Example*
0	Poor	"Once there was a lion that could out roar all the lions in the world. He belong to the Fleebay Circus. Millions of people went to see this lion. One day the lion thought he would retire from roaring. He settled down and got married and gave his repyoutation to his son. and now millions of people go to see him son."
1	Good	"My dog doesn't bark. He will play but he will not bark. He was sick, but now he isn't any more. He will bite people but not me. He will not bite me he likes to play with me though. I like to play with him too. We go to the park to play ball and he will come to. We play ball with him. people like to play with him too. He is a nice dog to play with. I like my dog a lot. he likes me too. He will sleep with me too. My sister's like to play with him too. some times we try to make him bark. He has toys to play with. I teas him all the time. He like to be teased by me and my sister's my Mother and Father too. He is a nice dog to have and play with too. He doesn't have flies either. I like Him to play with."

6-4. *Curiosity.* Does the production show keen curiosity? Is anyone in the story chiefly concerned with finding out why or what or how or when?

Score	*Description*	*Example*
0	Poor	"One day a cat came walking into Fish Town. The same day a woman saw the cat and bent down to pick up the cat. The woman thought the cat would scratch her but he did not scratch her. She was so surprised that she jumped!"
1	Good	"One day as I was coming home from school I saw a man and his wife talking and all of a sudden the man started to cry. and then the lady ran off. Then I didn't thing anything of it, so I went home. But one day latter I saw the man again going down the street crying. So I went to to him and said, 'why are you crying? and he wheiped his eyes and then all of

a sudden the man started to cry again. And I said, 'why are you crying about that lady?' And the man said, 'I'm not crying about that lady. I'm crying for my wife because she just had a baby with two hands, and four legs, and five arm's, and nine toes on each foot, and ten eyes.'"

6-5. *Fluency.* Is the subject fluent in his production? Here we are interested in fluency in the sense of verbosity. Our arbitrary cutting scores are as follows:

Forms A and B (15 minutes) ....100 words

Quite possibly, in the near future, these should be elaborated according to subject's grade and sex.

Score	*Description*	*Example*
0	Poor	"Once upon a time ther was a little dog born forgot to bark. The little dog saw gary olow Little gary olor said I will tell you how to bark it is like this owooo owooOooo no no said the little dog that he a way a gary olow barks but it is not away a little dog barks."
1	Good	"Long ago in ancient France, there Lived a woman whose name was Le don ya. She was a very pretty woman and had beautiful blue eyes, But one thing what was wrong with her, She would not talk. It was many years later now and she was getting older. The one day a man knocked at her her door and said that she would be thrown in the street because she could not pay her bills and taxes. The woman was very starled but she said nothing. then the man started to tear down the curtains and knock down her furnitures. the woman finally screamed out STOP! But the man kept on. then Le don ya said STOP IT then the man turned around and said you talked the woman tried it again and she said I did talk and from that day on I bet she was the happiest girl in the whole world. then the man married her and they lived happily ever after. THE END."

A composite score for "Richness" is obtained by adding up these five subscores.

Total Score

A composite total score is obtained by adding up composite scores on each of the six criteria considered. By definition, the highest possible total score is 30 points, while the lowest possible is zero. A reproducible scoring worksheet such as the one attached might be convenient in the scoring process.

SCORING WORKSHEET
CREATIVE WRITING PROJECT

Name: ____________ Sex: M__F__ Form: A__B__ Scorer: _____ Date: ___

School: __________________ Grade: ________ Teacher: ____________

1. Organization .... Subtotal ________
    - 1-1. Balance 0 1
    - 1-2. Arrangement 0 1
    - 1-3. Consistency 0 1
    - 1-4. Conciseness 0 1
    - 1-5. Clarity 0 1

2. Sensitivity .... Subtotal ________
    - 2-1. Stimulus perception 0 1
    - 2-2. Association 0 1
    - 2-3. Relevancy of idea 0 1
    - 2-4. Specificity. 0 1
    - 2-5. Empathy 0 1

3. Originality .... Subtotal ________
    - 3-1. Choice of topic 0 1
    - 3-2. Idea 0 1
    - 3-3. Organization 0 1
    - 3-4. Style of writing 0 1
    - 3-5. Sense of humor 0 1

4. Imagination .... Subtotal ________
    - 4-1. Imagination 0 1
    - 4-2. Fantasy 0 1
    - 4-3. Abstraction 0 1
    - 4-4. Identification 0 1
    - 4-5. Reasoning 0 1

5. Psychological Insight .... Subtotal ________
    - 5-1. Causal explanation 0 1
    - 5-2. Perspective 0 1
    - 5-3. Meaningfulness 0 1
    - 5-4. Ego-involvement 0 1
    - 5-5. Understanding 0 1

6. Richness.... .... Subtotal ________
    - 6-1. Expression 0 1
    - 6-2. Ideas 0 1
    - 6-3. Emotion 0 1
    - 6-4. Curiosity 0 1
    - 6-5. Fluency 0 1

TOTAL SCORE .... ________

RELIABILITY OF SCORING

To check the inter-scorer reliability of scoring, three judges were given the same set of 85 protocols and asked to score them independently according to the manuel. All three judges were alike new to the task of rating creative writing, but Judge A had had one year's experience with other creative thinking research projects while Judge B had spent about eight months in these projects. Judge C, on the other hand, was asked to perform the task without any previous experience with creativity projects.

Table 31 presents the results.

Table 31

Inter-scorer Reliability Computed from
85 Protocols Judged by Three
Independent Raters

	Judge		
	A	B	C
A	--	0.79	0.80
Judge B		--	0.76
C			--

PRELIMINARY NORMS FOR GRADES THREE THROUGH SIX

Provisional grade norms were obtained from 425 subjects in grade three through six of nine school (17 classes) in an around Minneapolis-St. Paul. Table 32 and Figure 2 present the results.

Table 32

Mean Creative Writing Scores for Each Grade and Sex

	Sample Size			Mean Score			Standard Devia.
Grade	Male	Female	Total	Male	Female	Total	Total
3	7	12	19	13.71	12.17	12.74	4.60
4	50	56	106	12.30	14.66	13.55	4.22
5	83	102	185	13.66	16.19	15.05	5.13
6	50	65	115	13.54	17.37	15.70	5.11
Total	190	235	425				

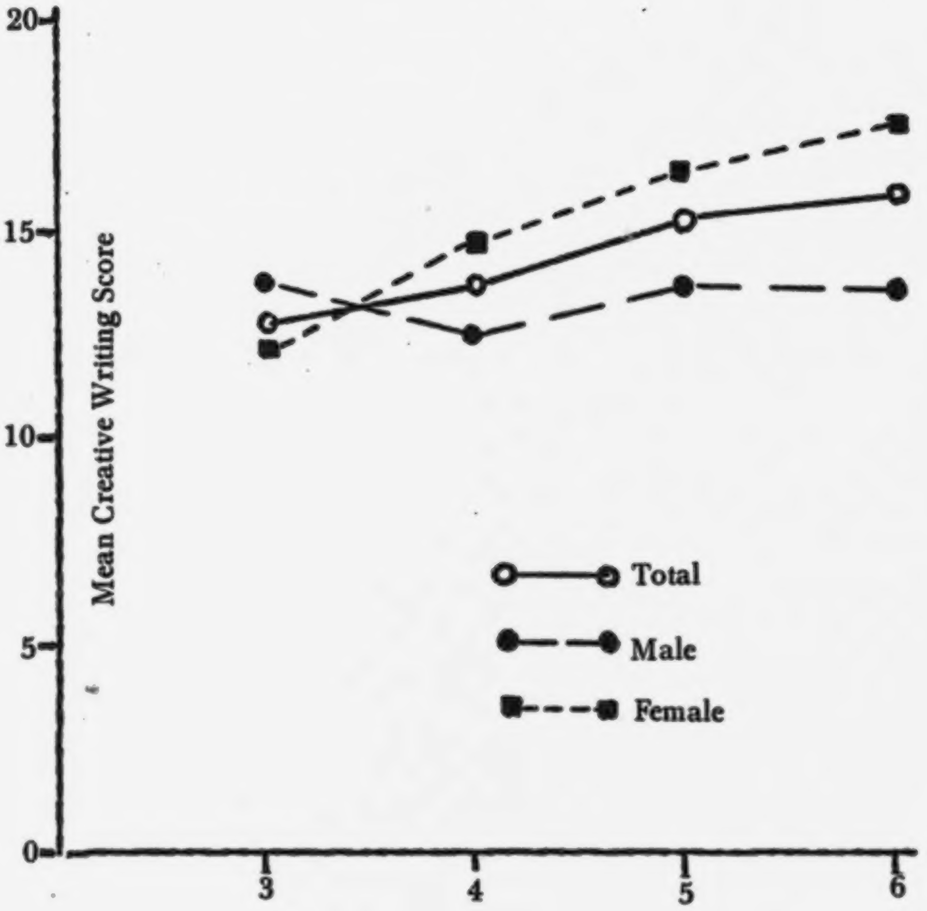

Figure 2 Provisional Developmental Curves for Mean Creative Writing Score

APPENDIX. SCORING OF SAMPLE STORIES

In the following pages, we present some production to show how we scored them in the total scoring process. Some are "good" (creative) examples and some are "poor."

I. EXAMPLE OF A "GOOD" UNFINISHED PRODUCTION

The Flying Monkey (Rating: 19)

"One sunny morning there was a baby born to a woman who lived in Africa. Now this baby was perfectly natural until he was two years old, then one night he grew long black hair all over his body and became a monkey. What was even stranger he started to grow and he grew at the rate of one foot an hour, and he kept this up for seven days. So that he grew one hundred and sixty eigt feet and counting the three feet he was to start with that made him one hundered and seventy one feet or fifty seven yards.

As if this wasn't enough he started to grow wings! With his new pair of wings he dcided to go exploring. So he flew off into the setting sun, but after flieing a bit he decided to turn a little to the north so that now he was heading strait for Los Angeles. After about a night flieing he came over the big city of Los Angeles and figures it would be a good place to stay. Now the people of Los Angeles didn't excakly crave the idea of a giant monkey in there city."

- - - - - - - -

Scored "one" on: Balance, Arrangement, Consistency, Conciseness, Clarity, Meaningfulness, Stimulus perception, Association, Relevancy of idea, Specificity, Idea, Organization, Style of writing, Imagination, Fantasy, Reasoning, Expression, Ideas, Fluency.

Scored "zero" on: Empathy, Choice of Topic, Sense of humor[*], Abstraction, Identification, Causal explanation, Perspective, Ego-involvement, Understanding, Emotion, Curiosity[*].

[*] Doubtful

II. THE STAR THAT DIDN'T TWINKLE (Rating: 25)

"Once there was a little star called Twankle. Now Twankle was a cute star and always twinkled faithfully. But one day Star Bright which was one of her sisters noticed that Twankle wasn't twinkling. "Whats the matter" said Star Bright. "Oh, hi Star Bright" repiled Twankle. "Don't you feel good" questioned Star Bright. "Oh, yeah I feel all right I guess, but I just don't feel like twinkling." "Why" Star Bright asked. "Oh, you see," said Twankle, "Martha who is a little girl I know isn't down there watching. She hasn't for several nites." Yes Yes" said Star Bright. So I don't feel like twinkling." Well why don't you see what the matter." I know," said Twankle, "Shes sick. Why don't you send down a star beam and make her well."

- - - - - - - -

Good example of: Balance, Arrangement, Consistency, Conciseness, Clarity, Stimulus perception, Association, Relevancy of idea, Specificity, Empathy, Choice of topic, Idea, Organization, Style of writing, Imagination, Fantasy, Abstraction (in the names assigned), Identification, Reasoning, Causal explanation, Meaningfulness, Expression, Ideas, Emotion, Curiosity.

Poor example of: Sense of humor, Perspective, Ego-involvement, Understanding, Fluency (in term of amount written.)

III. THE DOG THAT DOESN'T BARK (Rating: 21)

"Once upon a time there lived a dog that doesn't bark, his name was Barney. Barney was three years old. He couldn't bark because he didn't have no voice box. One night while Barney was dreaming an angel came into his dream she was an angel. Her name was Cassiopeia. Cassiopeia said to Barney, "When you get up in the morning, go to the market place, there you will see an old farmer leaving town, jump in his wagon, and get out of his wagon when you hear a robin calling, go to the brook and get in that boat, and go up stream until you come to Oak bridge, park the boat under the bridge and there you will find more directions, but you can only do it in four hours and goodby said the angel." Barney woke up the next morning and did exactly what the angel had said. After he had parked the boat, and read the directions, it said go and eat of the bark of the largest tree, and you shall bark again. Barney found the tree, ate the bark and he could bark."

Good example of: Balance, Arrangement, Consistency, Conciseness, Clarity, Stimulus perception, Association, Relevancy of idea, Specificity, Idea, Style of writing, Imagination, Fantasy, Identification, Reasoning, Perspective, Meaningfulness, Expression, Ideas, and Fluency.

Poor example of: Empathy, Choice of topic, Sense of humor, Causal explanation, Ego-involvement, Understanding, Emotion, Curiosity.

In doubt: Abstraction. (Did the author intend a subtle play on words through usage of "bark" in two senses? If he did, he should probably be given a "one" on this dimension.)

IV. THE MAN WHO CRIES (Rating: 7)

"Their was a man who cries and one early night in his deram he cried all night long and in the filed he cried all day and one night he cried so loud that he even yeled the peple kept on comeing to this house and told him not to yeled so one night he went to sleep and he was crying like a baby. So a man through he was a baby. He did not know it was a man so he went in and he bit the man. The man had a corn and the other man that was not crying he bit the man a his corn and the man corn got red it was so hot he yeled again. He did not know what to do the man started to cry and the man who was not crying he stoped. And it started all over again and that was the end of that man who started to cry. And he yeled and cried and did the same thing."

Good example of: Stimulus perception, Idea (original), Style of writing, Imagination, Ideas (Richness), and Fluency.

Poor example of: Balance, Arrangement, Consistency, Conciseness, Clarity, Association (imaginative but not relevant), Relevancy of idea, Specificity, Empathy, Choice of topic, Organization, Fantasy, Abstraction, Identification, Reasoning, Causal explanation, Perspective, Meaningfulness, Ego-involvement, Understanding, Expression, Emotion, Curiosity.

In Doubt: Sense of humor. (It is certainly "surprising" when the man goes in and bites the crying man on his corn. This probably rates a "one.")

V. THE DOG THAT DOESN'T BARK (Rating: 1)

Onic up a time there was a dog had to bark but he could not bark and he saw a dog the dog came up to the mother dog could nod bark."

Poor Example of: Balance, Arrangement, Conciseness (concise but it doesn't have any meaning), Clarity, Stimulus perception, Association, Relevancy of idea, Specificity, Empathy, Choice of topic, Idea, Organization, Style of writing, Sense of humor, Imagination, Fantasy, Abstraction, Identification, Reasoning, Causal explanation, Perspective, Meaningfulness, Ego-involvement, Understanding, Expression, Ideas, Emotion, Curiosity, and Fluency.

In doubt: Consistency. (It is consistent in that there are no contradictions or incompatibilities. It was rated "one" on this.)

VI. THE FLYING MONKEY (Rating: 15)

"Now once upon a time there was a flying monkey. Now this monkey had an A-bomb. One day the monkey was a///,/// feet. Suddenly his vertical propellers broke the his wings broke and the hortizontal prepellers broke. the End.

P. S. dear reader, we could not explain what happened next because it would be too bloody."

Good example of: Balance, Arrangement, Consistency, Conciseness, Clarity, Stimulus perception, Relevancy of idea, Idea, Organization, Style of writing, Sense of humor, Imagination, Fantasy, Meaningfulness, Expression.

Poor example of: Association, Specificity, Empathy, Choice of topic, Abstraction, Identification, Reasoning, Causal explanation, Perspective, Ego-involvement, Understanding, Ideas (Richness), Emotion, Curiosity, Fluency.

VII. THE FLYING MONKEY (Rating: 21)

"One day there was a monkey playing in the woods. His name was Willfread the LXVIII. (for some reason the monkeys seem to favor the name

Willfread.) Now Willfread could bound and leap and do somersaults from tree to tree, but this was not enough. Time after time he would watch the birds fly without a limit to wherever they wanted to go. Oh how badly he wanted to fly! Just then he missed the tree he was leaping to and fell down. He is in the air! falling! falling! Oh how he needs to fly! If he hits the ground, it will be curtains. (exit, stage left).

Then FLOP!......... If you thought, for one moment that this monkey was going to sprout wings and flyaway, you'r goofy."

- - - - - - - -

Score zero only on: Consistency, Choice of topic, Fantasy, Reasoning, Causal explanation, Ego-involvement, Understanding, Emotion, Curiosity.

VIII. THE HEN THAT CROWS (Rating: 27)

"There once was a mother hen how had five little baby chickens Now one of these five chicks, named Strooster May, crowned. This wouldn't be so unusual if Strooster May was a rooster, but, Strooster was a hen.

Strooster May went to all sorts of doctors and phsitions, but they all said 'Hopeless' with a capital 'H."

One day Strooster's (they called her that for short) mother noticed a slight red and blue tint in the Strooster's fetthers. 'Oh Dear' she cryed and ran (with Strooster daging behind her) to Hostiblabeyimun office. He examined her closely and said 'She's a he.' Mrs. Rooster fainted. Oh, what was she to do.

Strooster May, or Stroosts as they now call her, I mean him, says she, I mean he, is much more satisfyed being a he. End."

- - - - - - - -

Score zero only on: Causal explanation, Ego-involvement, Fluency.

SUPPLEMENTARY SCORING GUIDE FOR THE EVALUATION OF ORIGINALITY AND INTEREST

E. Paul Torrance

The instructions given for the writing of the imaginative stories and the experimental procedures teachers were asked to execute were all designed to encourage originality and interest. No ready-made scales for evaluating either of these characteristics could be located. Thus, the relevant literature was surveyed in an attempt to determine what characteristics of compositions had been considered in rating them on originality and interest by various groups. These were then listed and nine characteristics for each were selected as being appropriate for relatively objective scoring. Most of the criteria for interest were obtained from the work of Flesch and his associates. The others were gleaned from a variety of sources.

Evaluating Originality

In determining the ORIGINALITY score the following nine points or characteristics are considered and one point is given for the occurrence of either in the story:

1. Picturesqueness
2. Vividness
3. Flavor
4. Personal element
5. Original solution or ending, surprising
6. Original setting or plot
7. Humor
8. Invented words, names, etc.
9. Other unusual twist in style or content

Each of these points will be defined briefly and examples given.

1. *Picturesqueness*. Writing may be said to be picturesque if it suggests a picture, is colorful, is strikingly graphic, or is objectively descriptive.

The following story would be rated as *picturesque:*

> What a cold and dark night it was! Chester, my cat, was awfully lonesome and tired. That night he went to the hot house and saw a lot of fire flies. He asked them if they would make friends because he was lonely. But do you know what happened? They thought he was a fire fly too. You see his eyes glowed. So they sat on him and wouldn't get off. So the next morning Chester went into the house and he wouldn't scratch, or else he would have a hot foot.

The following story would *not* be rated as *picturesque:*

> Once there was a flying monkey that lives in a zoo. One day the zoo man went to feed it. He left the door open and he flew out and was never seen again.

Most of the stories written by children are picturesque, so an overwhelming majority of the stories will probably receive a score on this quality.

2. *Vivid.* A vivid story is told with liveliness and intenseness. The description is so interesting, or even exciting, that the reader may be stirred emotionally. It is vigorous, fresh, alive, spirited, lively.

The following story may be considered *vivid:*

> Once in a life time you see something that you might never see again. I was on an exploration with Prof. John Poe. He said, "Watch the porters. They are jumpy." I said, "Isn't this the place where the Silent Lion is supposed to be?" "Yes," he said. All of a sudden, the porters ran away! "What is it, Sir?" I asked. "It looks like a huge lion," Prof. Poe said. "Duck into those weeds!" As we watched, he ate all of our food. "Why don't we stop him" "It's too late now!" As we watched him, I noticed the fire. Then he burned himself on the fire and had a silent roar. And that's how I saw the Silent Roaring Lion.

The following story was *not* rated as *vivid:*

> If a cat would scratch me, I would scratch it back. I do not like to be scratched by a cat. If a cat would scratch me, I would try to make friends with the cat. If he likes me, I will feed him.

3. *Flavor.* A story may be said to have flavor if it possesses a noticeable characteristic element, or taste, or appeals to the sense of taste or smell.

The following story may be said to have *flavor:*

> Once there was a monkey names Jocke. He was not an ordinary monkey. One day when he was flying alone he met up with a crow. The crow spoke but Jocke couldn't so he just grumbled. When he grumbled, he scared the crow away. When he met a flying wornout shoe, he knew flying country was just ahead of him so he gained altitude and did he fly. When he got to the flying country he saw flying castles, shoes, houses, cows, pigs, and horses. "Boy, is this strange!" he said to himself. "I thought I was the only flying monkey on earth, but I'm not." He looked around and there it was - just what he was looking for - a beautiful flying princess and I mean it. After they got married they lived happily ever after.

The following was *not judged to have flavor:*

> Once a monkey wished to have wings and so he did have wings. He flew in the air. He liked to fly. One day he looked at the town so he went on the top of a house and got caught. Then he wished he didn't have wings.

4. *Personal Element.* A story may be rated as having the personal element if the author involves himself in the account or expresses his personal feelings or opinions about the events described.

The following is an example of a story having the *personal element:*

> One day I saw something flying around in the air. Something was funny about this. It wasn't a bird or a plane. It looked like a monkey.

After a while it came down on my bicycle. I went over to it. It wasn't afraid of me.

> I picked it up and on it was a tag. It said, "Do not be afraid of this monkey. It is just a regular monkey with wings." I kept the monkey for a pet. The only thing it would eat and drink was water, pop, bananas, and hot dogs. I kept it for three years. Then it ran away in the woods. I trailed him and he got in a space ship and flew away and I never saw him again. Oh, the monkey's name was Alex the Last.

The following story lacks the *personal element*:

> Well, once there was a lion who wouldn't roar for anybody. He wouldn't even roar for a piece of meat. They tried and tried but he never roared yet. So they shipped him to a small circus where he got so mad he finally roared.

5. *Original Solution or Ending, Surprising.* What we are looking for here is the "punch line." It need not be funny, though it may, but it must be unexpected, unusual, surprising.

The following story was awarded a point for this quality:

> One day three flying monkeys were flying around Pluto, when they spied a witch trying out her broom for Halloween. The monkeys went up to her. The first monkey said, "Could we go with you?"
>
> "Well," said the witch, "I guess so, but keep out of my magic book."
>
> "All right!" chorused the monkeys.
>
> They stayed at her space ship the rest of the night. The next day was the even of Halloween. By the time the monkeys got up the witch had packed everything on her giant broomstick. The monkeys saw there was not enough room for them and their belongings so they decided to wait for a few years. So they waited and waited for years, but she never came back. But they promised her they would wait, so I guess they are still waiting.

This ending is considered quite unusual because most children tell stories in which the flying monkey is rewarded for his conformity. Here they are punished for it. Stories in which the monkey "gets away with his flying" or is rewarded for his divergence are also scored for this category. The story of Jocko who married the flying princess is an example of the latter.

The following is an example of the former:

> Once there were some monkeys sitting in a group. They were all alike except three monkeys. They were different because they could fly.
>
> One day some men from the Park Zoo were looking for some monkeys because theirs had died. They came upon the three that flew. Of course, they didn't know that they flew, so they took them in a cage. When they got to the zoo, they put them in a cage that didn't have a top to it. They were in the sun one day and one monkey said to the other, "I wish we could get out of here."

> "Then why don't we fly out of here?" said the other.
>
> They started to fly out. When they got about half a mile, some men came to feed them. When they couldn't find the three monkeys, they looked up and saw them flying away and one said, "If we would have put them in a cage with the top, we would have had a real good thing here in the zoo."

The following story was considered quite lacking in this element of surprise:

> One day when I was at the zoo I saw a flying monkey. He was a very funny monkey. You give him something to eat and he would fly for you. He would act like a bird and do many other tricks for you. He was never sad; he was always happy.

6. *Original Setting or Plot.* This category is scored if the setting, plot, theme, moral, or plot is unusual or original.

The following story was scored in this category:

> One day when Sally Shaw was going to her sister's house, she saw a most amazing thing. She thought it was only a bird but this time it had a long tail. But then it landed, a monkey with the wings of an eagle. And down on the tip of its tail was a hook made of gold.
>
> She said, "Dear Monkey, won't you tell me where you came from?"
>
> But then he said, "What do you mean, where *you* came from?" But then she had a strange feeling. She looked around and realized she wasn't in the forest near her sister's house at all. Then she saw a sign that said, "THIS IS THE ENCHANTED FOREST."
>
> Sally yelled, "Oh, dear, how will I ever get out of here?"
>
> Then the monkey said, "Hold onto my hook and I will carry you away."
>
> Sally did and she was carried safely away. She kissed the monkey and said, "I've been a lot of strange places and seen some strange things, but I'll tell you, of all the things I've seen you take the cake."
>
> And so Sally never told what she saw, and I think you know why.

The following account lacks this characteristic:

> Once I saw a monkey at the zoo. He laughed and talked and whistled, so very, very much. But the funniest thing I ever heard of was that I found out he could fly.

7. *Humor.* Stories are scored for humor if they have the quality of portraying the comical, the funny, the amusing. One simple criterion would be to score it for this category if it makes the rater laugh or smile. This is useful in only a small degree, however. Thus, it has been necessary to look for clues in the works of some of the better known humorists: bringing together certain incongruities which arise naturally from situation or character, frequently so as to illustrate some fundamental absurdity in human behavior or character.

The following story was awarded a point for *humor:*

> One day in Africa near Molguatua, I went hunting with a couple of natives. We went to Nautga, land of monkeys. We went around a corner and were surprised by 20 cannibals, hunting for food. We ran and ran. They ran after us. We hid in a forest but suddenly we were surrounded by cannibals and taken to their camp and put into a pot to boil. Just as they began to light to fire, the Chief said, "Don't forget the carrots and lettuce and hold the onions!" They lit the fire and suddenly out of nowhere came hundred and more hundreds of monkeys FLYING! I said to the natives, "This is the live end!" We got out of the pot and ran to Molguatua. I got on a plane and flew home to stay.

In this account both the speeches of the chief and of the author and the dive bombing of the monkeys may be regarded as humorous twists. (The story was entitled "Dive Bombed in the Jungle.")

The story which follows, though somewhat interesting, was not rated as having humor:

> "The circus is today," said Mary. "Should we go now, Nancy?"
>
> "Yes," said Nancy.
>
> When they got there the circus had started. Second we will have the strong man. Third we will have the roaring lion. The lion would not roar so the owner whipped him. He still did not roar. One man got so mad that he came and the owner said he could have him and he went home. This owner was nice and he roared for him.

Some may see in this story a subtle humor in the absurdity of the trainer's use of violence to make the lion roar. The theme, however, is sufficiently commonplace to cause us to rate it as lacking humor. A more unusual theme or a more clever handling of this absurdity of human nature might have been rated as humorous.

8. *Invented Words, Names, etc.* When parts of two or more words are combined to express some concept, when animals and persons are given amusing names or names appropriate to their character, or the like, credit is given in this category. The following is an example of the use of amusing names:

> Once upon a time there were three monkeys. They were nice monkeys. Their names were Pickle, Tickle, and Nickel. Pickle and Nickel were very active. Tickle was a very inactive monkey. He just sat around and watched the birds. One day Pickle said, "Why are you so sad?"
>
> Tickle said he wanted to fly, but Pickle said, "You will never fly. Don't you know that?"
>
> The next day Tickle got out of the cage while the man was feeding Pickle and Nickel. He got out and climbed a tree. For a minute, he was dizzy. Then he saw Pickle and Nickel. He said, "Hi, Fellows."
>
> Nickel said, "Hey!"
>
> Pickle said, "There is Tickle!"

> The man saw him too and started up after him. Tickle went up higher. About ten minutes later the man almost caught Tickle. Then Tickle fell and started to fly. He flew all over town. The people looked at him. He was the happiest monkey ever.

In other words, Tickle was "tickled" that he could fly.

The following involves not only a "play names," but also play with sounds:

> "Once there was a lady named Miss Jabberbox. Miss Jabberbox never talked much and every thought she was bashful.
>
> One day she decided to teach school, so that day she started to teach. Everyone liked her and they thought she was bashful, too, so they tried to make her talk and laugh. They asked her questions and told her jokes, but they still couldn't make her talk!
>
> At the end of the week, they only got one word out of her and that was "Boo." After the next week they got two words out of her. They were, "Boo ooh!" The weeks went on and on and finally it was the last day of school. When she came to a snake, she screamed out, "Ooh boo soo goo loo doo!" No one understood her but they knew why she never talked. It was because she spoke French. Well, she never learned English and no one has ever been able to make her talk since.

9. *Other Unusual Twist in Style or Content.* This category was added primarily for the purpose of giving credit for a high type of originality not adequately reflected in the eight foregoing categories. The following story was awarded a point in this category:

> "I, Theodor Tompson, being of sound mind do herewith bequeath all my worldly goods to Albert Tompson, my only son."
>
> I found myself writing this in a place I never expected to. I always saw myself in my bedroom sitting on my deathbed and writing away. But there I was in the old Jackly house in an almost dark room with a barred door. How I got here is quite a story.
>
> It all started one month ago when a strange man burst into my room. "Mr. Theo Tompson, the detective?" he asked.
>
> "Yes," I said, "but good heavens, man, what's wrong?" Then he explained. His name was Mr. Grayson. He never told me his first name though. It seemed he came from the old Jackly place as caretaker. He told me that there were flying monkeys at the house. I didn't believe him so he offered to show me.
>
> I got out of the car at the house and Mr. Grayson opened the door cautiously. All of a sudden a monkey from the upper part of the house grabbed him by the collar and carried him off. I ran upstairs, got in the bedroom, and barred the door. I then wrote my will as I told you. Afterwards, I heard a knock at the door. I drew back with fear. The door opened and Mr. Grayson walked in.
>
> "But you're alive!" I said.
>
> "Why, of course!" he said. You see this is a movie set. We needed

> someone who didn't know what was happening to make it more real. The movie was about flying monkeys and the one you saw was a prop on strings."
>
> I am glad there aren't real flying monkeys though.

Scoring Guide for Evaluating Interest of Imaginative Stories

In deriving a set of criteria for use in assessing INTEREST in imaginative stories written by children, we have been guided largely by the work of Flesch and his associates (Flesch & Lass, 1955). The following nine indicators are considered and one point is awarded for the presence of each:

1. Conversational tone
2. Naturalness
3. Use of quotations
4. Variety in kind of sentence
5. Variety in length of sentence and structure
6. Personal touch
7. Humor
8. Questions and answers
9. Feelings of characters.

It will be noted that "personal touch" and "humor" have been used as indicators both of originality and of interest. Since both contribute to originality and interest, this seems defensible.

1. *Conversational tone.* Many children tell a story just as though they were carrying on a conversation with the reader. Others write more formally and thereby spoil the reader's interest. The following is an example of *conversational tone:*

> There is a girl or maybe I should say tomboy living near me. She likes to play baseball. As a matter of fact, she likes any boys' games. She likes to play football, basketball, and all.
>
> Her name is Dolly or maybe I should say Darlene. Dolly is her nickname, you know.
>
> She would always put a pressure hold on boys, if they wouldn't mind her. Her mother tells her to be lady-like for in a couple of years she will be going to parties and boys will be scared to dance with her.

The story below of "The Wild Stallion" also has a *conversational tone:*

> A long time ago when there were cowboys, people rode and broke horses. If you talked to an old-timer you would hear many tales of the old west. I am going to tell you one. It is about a wild stallion. Do you want to listen?
>
> It is a beautiful spring morning and Star is two weeks old. He is called Star because of a white star on his forehead. The rest of him is black.

> Star's father was a black stallion with a long tail and mane. He was a big, beautiful stallion. His mother was a big black mare with a star.
>
> Star and his mother were dodging the ranch hands for she was a ranch horse and she did not like to work.
>
> One day the hands caught them. Star gave a good fight but it was a waste of time. I would like to tell you more about Star and his adventures, how Star got away and was not caught until he was four years old and how they tried to train him but I must end my story now.

2. *Naturalness.* Usually, but not always, stories written in a conversational tone are "natural." The conversation, however, may be stilted and artificial; it would still be "conversational in tone" but not "natural." A story may also have "naturalness" without being "conversational." The following is an example:

> There was a little monkey who lived in the jungle on bananas and coconuts. All day he swung from vine to vine searching for food. A year ago his mother and father were captured by a hunter and carried to a zoo. Now he was left alone in the jungle. Later a band of Indians caught him sleeping and the witch doctor gave him wings to fly.

3. *Use of Quotations.* A score for *use of quotations* is given whenever the direct words of the speaker are given. Many children in the early grades (third and fourth) have not been taught to use quotation marks, although some use them without being taught. Thus, credit is given whether quotation marks are used or not. Almost all stories credited with *use of quotations* have a *conversational tone.* Many having a *conversational tone,* however, do not include the use of *quotations.*

4. *Variety in Kind of Sentence.* Two types of *variety of kind of sentence* can be considered and either gives credit in this category. Sentences may vary according to use: declarative, interrogative, exclamatory, etc. They may also vary according to form: simple, complex, compound, and compound-complex. In a short story (under 150 words) any varation of either type qualifies for credit. In longer stories, there must be three or more variations in form and/or use.

5. *Variety in Length of Sentence and Structure.* If there is a mixture of short and long sentences this category is scored. Also credit is given for any variation in the structure of sentences, such as predicate before subject, dependent clause before independent clause, and the like.

6. *Personal Touch.* Same as *personal touch* under ORIGINALITY

7. *Humor.* Same as *humor* under ORIGINALITY

8. *Questions and Answers.* Two types of question-and-answer technique are scored for this category. There may be questions and answers in the direct quotations of speakers. Or, the writer may ask the reader a question and then answer the question. Either is scored for this category.

9. *Feelings of Characters.* If the feelings of characters in the story are given either through own words or through the eyes of the writer, this category is credited. The following is an example:

> The monkey was flying very high and he began to cry. He was thinking about all of the other monkeys that don't know how to fly. He was thinking about what fun they are missing.
>
> Then he flew far away from home. Then he stopped and said, "I want to go home to my mother and sister."
>
> As he was flying home, he saw six monkeys and married.

Reliability of Scoring

Three judges were used to arrive at inter-scorer reliability. The scoring task was new to all three but Judge A was an established research worker with more than three years' experience in creative thinking research projects backed up by a long history in personality research and counseling. Judge B, on the other hand, had had only two month's experience with creative writing projects, while Judge C had no training whatsoever when he was asked to perform the task.

Table 33

Inter-scorer Reliability on Originality and Interest Scores

Judges	Number of Protocols	Reliability	
		Originality	Interest
A and B	25	0.88	0.84
A and C	30	0.84	0.82

Preliminary Norms for Grades Three through Six

Provisional grade norms were obtained from 275 subjects (prior to training) in grade three through six of seven schools (eleven classes) in and around Minneapolis-St. Paul. Table 34 and Figure 3 present the results.

Table 34

Mean Originality and Interest Scores for Grade Three through Six

	Sample Size	Originality		Interest	
		Mean	Std. Deviation	Mean	Std. Deviation
3	19	3.47	2.14	3.79	1.70
4	56	3.86	1.86	4.54	1.90
5	131	3.78	1.71	3.73	1.60
6	69	4.65	1.89	5.07	1.87
Total	275				

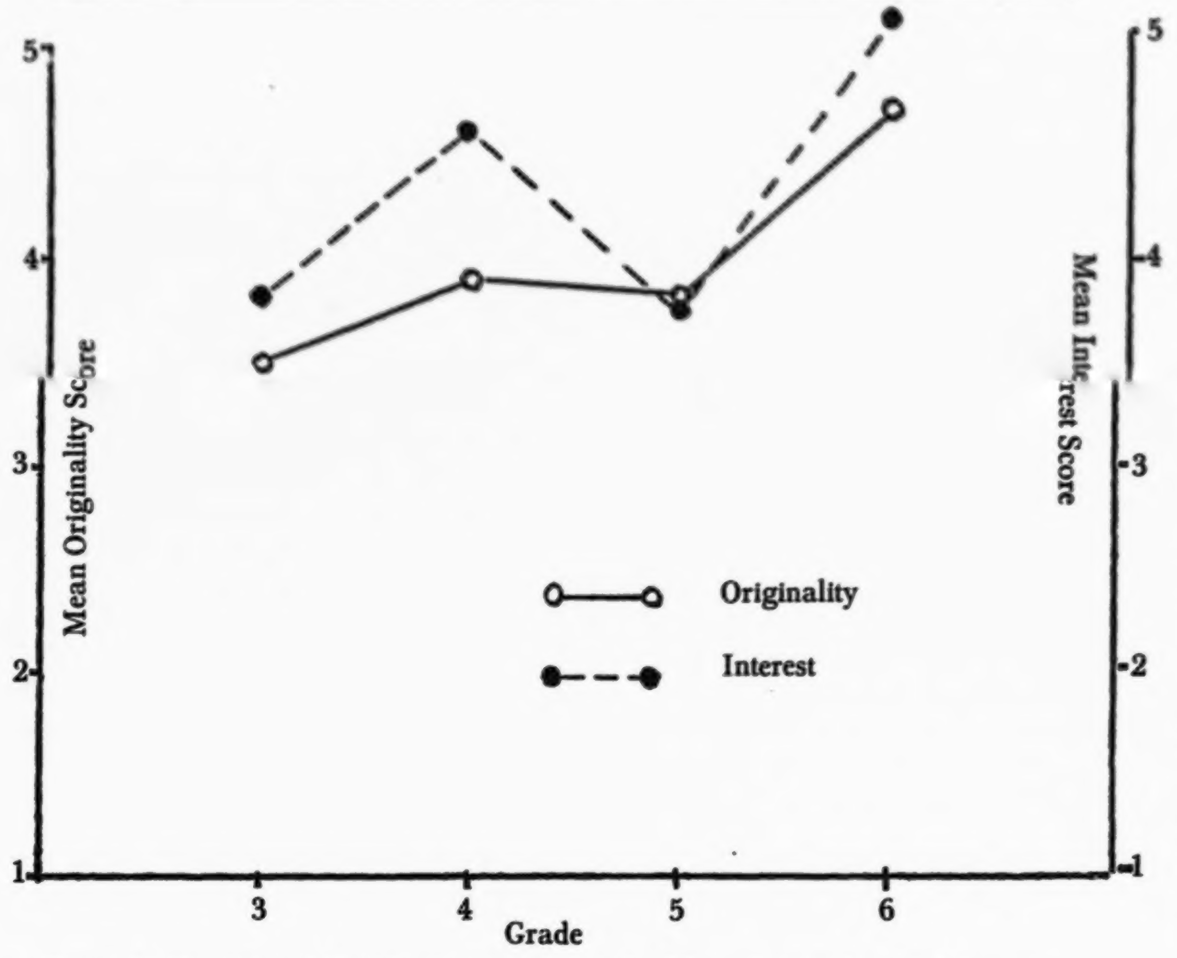

Figure 3. Provisional Developmental Curves for Mean Originality and Interest Scores

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